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REPORT

OF THE

AGRICULTURAL DEPARTMENT IN ASSAM

For 1884-85.

By H. Z. DARRAH, Esq., C.S.,

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REPORT OF THE AGRICULTURAL DEPARTMENT IN ASSAM FOR 1884-85.

No. dated Shillong, the 2nd September 1885.

From—H. Z. Darrah, Esq., Officiating Director of Agriculture, Assam,

To—The Secretary to the Chief Commissioner of Assam.

Sir,

I have the honour to forward herewith the second Annual Report on the Administration of the Department of Agriculture in Assam for the year ending 31st March 1885.

Change of Directors.

2. Mr. Stack held the post of Director from the beginning of the year till 28th June 1884, when I took over charge from him. During the remainder of the hot weather I was occupied in writing the Reports on the Foreign and River-borne Trade of the Province, and in making myself acquainted with the details of the work

Cold-weather duties.

3. In July I paid a visit to Gauháti, and inspected the settlement office there. In September I visited Gauháti again, and, after a second inspection of the settlement office, went on a short tour through Tezpur, Sibságar, Jorhát, and Mangaldai, looking chiefly into the working of the survey schools. On 28th October I went down to Gauháti, and started on 4th November for Rangia. This place is the head-quarters during the cold weather of the cadastral survey party engaged in the field survey of Kámrúp, and, consequently, the head-quarters of the settlement office by which the mandals' records are being brought into agreement with the new village maps. The settlement office is in the immediate charge of the Director, and I spent the remainder of the year 1884 in arranging for the work of the cold weather, in starting the various survey parties and inspecting them in the field, and in formulating a set of definite rules for the guidance of settlement-operations.

Cold weather tour.

4. On 1st January 1885 I started for my cold-weather tour. After visiting Mangaldai, I marched along the north bank of the Brahmaputra, through Tezpur, to North Lakhimpur. Then I crossed the river to Jorhát, and a few days later took steamer to Gauháti, which I reached on 2nd February. Next day I was back in Rangia. On the 10th I met the Chief Commissioner at Gauháti, and on the 15th started for the Darranga Fair, and went up on the 16th to Dewangiri. On the 21st I returned to Rangia, and then till the end of the month was occupied in inspecting survey parties at work in the field.

Tour in Nowgong.

5. On the 7th March I met the Deputy-Commissioner of Nowgong at Desh Myung, and marched with him through the chapari *mahál*s of his district till the 26th, when I went over to Tezpur to meet the Deputy-Commissioner of Darrang, in consultation with whom some rules were drawn up for the guidance of mauzadars in preparing their annual papers. On the 28th I returned to Nowgong, and thence marched back to Gauháti, making enquiries as to cotton at Chapparmukh, and inspecting the traffic registration station at Jagi on the way.

Work at Rangia.

6. On the 14th April I rode out to Rangia, and on 16th held an examination of the mandals belonging to the nine mauzas which had been cadastrally surveyed in 1883-84, and of certain approved candidates who were to be substituted for such of the mandals as failed to pass. The necessity for, and the importance of, this examination lay in the fact that new records and new maps had been prepared for the villages of the nine mauzas above referred to, and it was essential that, as far as possible, competent men should be selected to prepare the papers for the settlement of 1885-86 upon the new lines.

Tour in South Kámrúp.

7. After arranging all details in connection with this, I went with Mr. Barrett, the Deputy-Superintendent in charge of the survey party, to the south bank to inspect the main circuits taken up for the cadastral survey of next year. I took the opportunity at the same time of finding out the manner in which the mauzadari papers were kept up in four of the five new tahsils.

Concluding operations at Rangia.

8. On the 26th we returned to Rangia, and, after arranging with the Extra-Assistant-Commissioner in charge of the settlement office the manner in which the work was to be carried on when field operations were over, I went on the 30th to Gauháti, and on the 2nd May to Barpeta. From there, I dropped down the Chawlkhwa in a boat to Goálpára, and on the 5th took steamer to Dhubri. On the 7th I returned Gauháti, and the next day started for Shillong.

District Administration Reports.

9. In March 1885, instructions were issued by the Chief Commissioner, directing all Deputy-Commissioners to furnish to this office by 1st May copies of the following sections of their Annual Administration Reports :—

(1) Weather, crops, and prices.
(2) Consumption and production.
(3) Trade and commerce.
(4) Manufactures.

The following statement shows the dates on which these returns (complete) were received:—

From	Deputy-Commissioner,	Nowgong	on	1st May
,,	,,	Naga Hills	,,	7th ,,
,,	,,	Garo ,,	,,	11th ,,
,,	,,	Goálpára	,,	15th ,,
,,	,,	Cachar	,,	16th ,,
,,	,,	Sylhet	,,	22nd ,,
,,	,,	Khasi and Jaintia Hills	,,	2nd June.
,,	,,	Darrang	,,	6th ,,
,,	,,	Lakhimpur	,,	24th ,,
,,	,,	Sibsagar	,,	5th July.
,,	,,	Kamrup	,,	7th August.

10. I now take up in detail the headings of this Report, as prescribed by the Government of India in Circular No. 54A., dated 28th April 1884.

I.—Organisation and Maintenance of Village Records.

A.—Field-books, Rent-rolls, and Leases.

Changes in mauzadars' papers.

11. Mr. Stack in last year's report described in detail the revenue system of the Assam Valley, and explained the nature of the village records maintained and the character of the agency employed to keep them up. The changes that were originated and started in 1883-84 were the following :—

(1) The preparation of an abstract at the end of the dág chitha, showing the area under various crops in each mauza.
(2) The preparation of an abstract showing the changes that had been brought about by the relinquishment of lands and the taking up of fresh cultivation.
(3) The introduction of decennial leases.

New forms.

12. Besides the above, which were passing through their second year of existence during the period under report, a very important change was inaugurated in January 1884, and carried into effect for the first time in the village papers of 1884-85. This was the introduction of the new forms described at length in paragraphs 13 to 18 of last year's report.

As was natural, these new forms were to a certain extent misunderstood in the first year in which they were tried, notwithstanding the issue of instructions as to the method of keeping them up. It was difficult to predict exactly what were the points on which mandals were likely to go astray until some experience had been gained, and it was found consequently that as to some matters the instructions were not sufficiently detailed. This was apparent upon my inspection of the mauzadars' papers last cold weather.

Confusion in numbering.

13. The main point upon which confusion was found to exist was the numbering of the fields in connection with the introduction of the decennial system. Where settlements of all lands were made annually, the serial numbering of the leases was the same as that of the holdings in the jamabandi, from which these leases were copied, and the numbering of the fields was the same in the dág chitha, the jamabandi, and the lease. When decennial pattas were, however, first given out, the numbers of the fields as entered on the back of the lease, became permanent for ten years; but in the dág chitha, which altered from year to year, and, therefore, also in the jamabandi, the same numbers did not continue to apply to the same fields, and an element of serious confusion was introduced. The efforts made by mauzadars and mandals to obviate the effects of this were many and varied, as will appear from my remarks below; but the result was that the method of keeping up the papers varied from district to district, and in some cases even from mauza to mauza, to an extent which could not possibly have been anticipated. The evil fortunately was in its infancy, but another year or two would have produced a state of confusion in the settlement records, which might have rendered necessary a reversion to the original system of annual leases.

14. I inspected mauzadars' records in Darrang (Mangaldai and sadr sub-division), Lakhimpur (North Lakhimpur sub-division), Nowgong, Sibságar (Jorhát sub-division), Kámrúp (Barpeta and sadr sub-division). The following remarks will give an idea of the state of things I found prevailing.

Districts inspected.

a.—Darrang.

15. In this district many of the mauzas consist of groups of sub-mauzas. These sub-mauzas were the old territorial divisions, which, being found too small for our revenue purposes, were amalgamated into groups, and each group placed under the charge of one mauzadar. Generally, there is but one mandal to each sub-mauza, but if the latter is large, there may be two or even three mandals. For each sub-mauza is prepared generally a separate dág chitha, in which the dágs are numbered consecutively from No. 1 to the last number of the sub-mauza. The next sub-mauza of the group has similarly a separate dág chitha in which the dágs are also serially numbered, beginning at No. 1. If there are two mandals in a sub-mauza, they write up their dág chithas separately, each man for his own circle. Then one of them numbers his dágs from No. 1 to whatever may happen to be the last number. The second mandal begins numbering from the point where the first mandal left off. The two books are amalgamated, and one dág chitha is formed. The system of numbering varies from place to place. Sometimes the numbers entered in column 2 are in one series for the whole sub-mauza. Sometimes the fields periodically settled have no numbers given to them in column 2, merely one number (that taken from last year's dág chitha) in column 1. Sometimes each mandal's circle has a dág chitha to itself, with its own series of numbers unconnected with those of any other mandal. Sometimes all the numbers of all the mandals of one group of sub-mauzas form one series. In no case did I find the fields periodically settled entered in a different dág chitha from the fields annually settled, though the Deputy-Commissioner had noticed this arrangement in some places. I also found that in some cases the periodically-settled fields showed in column 2 of the dág chitha the number that had been in column 2 of the dág chitha of 1883-84. Consequently, in these the figures in column 2 did not run serially. Thus, in one case the numbers ran 85, 86, 87, 1,390, 88, and so on. This system was apparently adopted, because all the leases of the lands settled for ten years showed the field numbers for 1882-83 and 1883-84, and these also were the numbers entered in the jamabandis of 1883-84, which were simply copied for 1884-85.

Dag chitha

16. Similarly, the jamabandi varied from place to place. Sometimes, there were three for each group of mauzas, one showing the fields settled for one year, another those for ten years, and a third those for nine years. Almost always the periodic jamabandis showed two distinct series of leases, one referring to lands settled for ten years and one to lands settled for nine years. Generally, the leases were numbered serially for the total area under one mauzadar, there being only one series for ten year, nine year, and one year alike. Sometimes these leases formed one series in the annual jamabandi and another series in the periodic jamabandi. When one mandal had entered all his annual leases, he numbered them. Then the next mandal of the mauza went on with his annual leases, numbering them consecutively from the point at which the former mandal left off. Sometimes these lease numbers of the periodic jamabandi were in hopeless confusion. The first lease was in one case 5 in a certain mandal's jamabandi, then the next 6, then came 10, and so on, the missing numbers of the series being found in the periodic jamabandi of another mandal of the same group of mauzas. Generally there were two numbers for each field in the jamabandi. In the annual jamabandis the current year's number was that shown opposite the field in column 2 of the dág chitha of 1884-85, and the second number was that of the previous year. In the periodic jamabandi one number was sometimes that for 1884-85 (in which case the second number was that for the previous year), or it was that for 1883-84 (in which case the second number was that for 1882-83). The former system was the more common, and, unless altered, will in 1885-86 lead to great confusion, for this reason. The ten-year leases were given out in 1883-84. They show for each field two numbers, those entered in columns 1 and 2 of the dág chitha of 1883-84. In 1883-84, therefore, the dág chitha, jamabandi, and patta all agreed with each other. Next year the dág chitha showed for the same fields in column 1 the number for 1883-84, and in column 2 the number of the current year, 1884-85. This latter number was, of course, not on the patta, but the number entered in column 1 of the dág chitha of 1884-85 was. Consequently, the field could be identified. In 1885-86, however, this number will, according to this system, disappear. The dág chitha of 1885-86 will show in column 1 the number of 1884-85, and in column 2 a new number for the current year 1885-86.

Jamabandi.

The jamabandi of 1885-86 will show the same two numbers, and the patta given out in 1883-84 will show neither. It was to avoid this difficulty that several mauzadars introduced the plan of continuing to enter in the dág chithas and jamabandis of 1884-85 or the ten-year fields the numbers shown in the leases issued in 1883-84.

b.—Lakhimpur.

17 In this sub-division no nine-year leases were given out at all. Apparently, it was understood that ten-year leases were to be issued in 1883-84, and that no periodic settlements at all were to be made afterwards. All leases, therefore, given out since 1883-84 have been annual. In the dág chithas, the original numbers of the fields, those given in 1883 84, are still retained in many instances for the fields settled for ten years. Therefore, in column 1 of the dág chitha for 1884-85, we have the number of the year 1882-83 and in column 2 of the same the number of 1883-84. In order to make these latter numbers run serially with those for 1884-85, the mandals have put them into the places they would occupy serially, without regard to the fact that the neighbouring fields in the dág chitha may not be contiguous on the ground. Sometimes the field numbers are arranged in one series for each mandal's circle, sometimes in one series for each sub-mauza.

Dag chitha

18. The jamabandis, too, vary from mauza to mauza. Sometimes two numbers are entered opposite each field, sometimes only one number. Where one number only is entered, it generally belongs to the year for which the lease was issued. Where two numbers are shown, they belong to 1883-84 and 1884-85, that is, one number is the same as that given in the year when the lease was issued, and the other that of the current year. Only the former of these numbers agrees with what is on the lease itself. The leases are generally numbered in one series in the annual, and in another series in the periodic jamabandi

Jamabandi

c.—Silságar.

19. The only portions of this district I was able to visit were Jorhát and the Majuli. The dág chitha numbers form one series for the whole of each mauza. Consequently, they go up inconveniently high. In the Majuli they run up to over 12,000. Where fields have been settled for ten years, no entries are made in column 2 of the dág chitha of 1884-85, the old number only is retained in column 1. As far as possible, an effort has apparently been made to keep these old numbers in their serial order, but it has not always proved possible to do so.

Dag chithas.

20. In the jamabandis the ten-year settlements come first, then those made for nine years. These form one volume for each mauza, the annual jamabandi forms another volume. The leases are numbered in one series for the periodically-settled fields, and in another for the annually-settled fields. Only one number is entered opposite each field in the jamabandi. In the annual jamabandi it is the number of the current year from column 2 of the dág chitha. In the periodic jamabandi it is the same number as that given to the field in the dág chitha of 1883-84.

Jamabandi.

d.—Nowgong.

21. I saw a good deal of this district, as I was in it for more than one month. In many parts of the chaparis I found that no decennial leases had been issued at all. The first periodic settlement was for nine years, and was made in 1884-85. Consequently, the difficulty of so arranging that the dág chitha, jamabandi, and decennial lease shall always agree has not yet arisen here. In the dág chithas the numbers generally run serially through the whole mauza, no distinction being made between annually-settled and periodically-settled fields. In one mauza the last number was 12,080. Away from the chaparis decennial leases had been issued in 1883-84. In the dág chithas column 2 was blank for fields so settled, only the number of the previous year being recorded. These fields were entered according to their geographical position. Consequently, their numbers were not in serial order.

Dag chithas.

22. The jamabandis were curiously arranged. All the leases generally formed one series for the whole mauza, those for one, nine, and ten years being all intermixed. Thus, in one mauza there were 4 circles. First came the annual leases of the first circle, then the periodic leases of the first circle. Next in consecutive order, and continuing the series of numbers, the annual leases of the second circle, and then the periodic leases of the second circle, and so on. It is easy to see what lamentable confusion would be caused by this system in 1885-86, when new numbers will have to be given to the annual leases. Only one field number is shown as a general rule in the jamabandis. The jamabandi

Jamabandi.

arrangement of mauza Sinnia Potanni was the most curious I had ever seen. I give it in detail below.

First Mandal's Circle.—The nine-year leases were entered first, beginning with No. 1 and ending with No. 157. Then came the ten-year leases, beginning with No. 1 and ending with No. 180. Next a group of ten-year settlements made in 1877, beginning with lease No. 466, going on to No. 192, and ending with No. 343. Then a group of leases relating to 1876, beginning with No. 123 and ending (no consecutive series between) with 492. Next a group given out in 1875, beginning with No. 134 and ending with No. 133 (only 3 leases here, and 2 of them numbered 133).

Second Mandal's Circle.—First, the annual settlements, beginning with 158 (continued from the nine-year leases of the first mandal) and ending with No. 194. Then the nine-year leases, beginning with 195 and ending with 416. Next the ten-year leases, beginning with 181 (continuous from the ten-year leases of the first mandal) and ending with 403.

Third Mandal's Circle.—First, annual leases, beginning with 417 (continued from the nine-year leases of the second mandal) and ending with 485. Then the nine-year leases, beginning with 486 and ending with 654. Then ten-year leases, beginning with 404 (continued from the ten-year settlements of the second mandal) and ending with 580.

Fourth Mandal's Circle.—First, nine-year leases continued from the nine-year lease of the third mandal, and ending with 992. Then, a group of ten-year leases, beginning with 1 and ending with 305. Then ten-year leases given out in 1877 beginning with 613 and ending with 656. Then ten-year leases for 1876, beginning with 292 and ending with 427.

Fifth Mandal's Circle.—First, nine-year leases, beginning with 993 and ending with 1,229. Then ten-year leases, beginning with 222 (continued apparently from nothing in particular) and ending with 424. Then ten-year leases of 1877, beginning with 37 and ending with 800 (though only 5 of them). Then ten-year leases of 1876, beginning with 484 and ending with 657 (but only 13 of them). Then annual leases from No. 1,230 (continued from the nine-year leases of this mandal) and ending with No. 1,655. Then a group of ten-year leases, beginning with No. 1 and ending with No. 221.

e.—Kámrúp.

Dág chithas.

23. In Kámrúp there are separate dág chithas, with a separate series of numbers for each village. I examined the papers of the Pati Darrang, Palashbari, Choygaon, and Boko tahsils, also those of the Barpeta sub-division. The customs differed everywhere.

Pati Darrang.—In this tahsil each mandal prepared for 1884-85 one dág chitha for annually-settled fields and one dág chitha for periodically-settled fields. Consequently in the arrangement geographical contiguity was sacrificed. All the mandals of each mauza together prepared one jamabandi for that mauza for annually-settled fields. This and the dág chitha for annually-settled fields agreed, but the jamabandi, though annual, was prepared on ten-year forms (B—Part II.). No jamabandi was made out in 1884-85 for periodically-settled fields. One for the whole mauza had been prepared in 1883-84, but this was in the old form, not in that now in use, and of course none of the numbers in it could be found in the dág chitha for fields periodically settled in 1884-85.

Palasbari.—Here the dág chithas had numbers serially arranged by villages. The papers of this tahsil were mainly remarkable for the fact that, though periodic leases were issued in 1883-84, yet all were taken back and fresh ones issued in 1884-85, exactly the same as if the settlements had been for one year only. The reason given was that, as tenants are allowed to give up their fields, whether annually or periodically settled, the lease numbers and the field numbers are always going astray, and, as it was essential that the lease numbers should correspond with the jamabandi holding numbers, and the numbers of the fields in the leases and jamabandis with the numbers given to the same fields in the dág chitha, it was necessary to issue new pattas every year. No attempt of any kind had been made to differentiate what should be permanently and what annually settled, for I found that in Choyani and Barunti none but ten-year leases had been given out. In Dokin Sorobongsor the settlement had all been annual, and in Rani all the leases were periodic, with the exception of those of two villages in the dry bed of the river for which annual pattas had been issued. All the jamabandis in the tahsil were on B—Part I. Forms (that is, annual), and there was only one series of patta numbers for each mauza.

Choygaon.—The salient feature of the papers of this tahsil was that all its five mauzas were periodically settled in 1883-84 (even the daryabadi tracts), and yet all the leases were made out afresh and issued in 1884-85. This was done to avoid the trouble of

distinguishing between those holdings which should be periodically and those which should be annually settled. It was considered far easier to sit down and re-write all the pattas.

Boko.—Dág chithas here have an arrangement of their own. The numbers for each village run serially from 1 to the last number of the village, but all the periodic fields are entered first with the word "ten-year" above them, and then the annually-settled fields are shown. All the periodic leases given out in 1883-84 were changed last year, just the same as if the settlements had been annual. The jamabandis are in two forms, B—Part I. and B—Part II., and each mauza has some periodic and some annually-settled fields. But, as all were changed last year, there is no confusion or difficulty about the numbers. Practically, therefore, in Palasbari, Choygaon, and Boko, the settlements were all annual, but some of them were made on periodic forms.

Barpeta sub-division.—Here, again, the customs are peculiar. All the dág chithas of the different villages in one mandal's circle form a separate book. Each village has two sets of serial numbers, and its name occurs twice in each mandal's book. First are entered all the annually-settled fields in all the villages, each village having its own set of numbers, beginning from 1. Then are entered all the fields of all the villages which have been periodically settled, also each with its own set of serial numbers.

As to the jamabandis, none were made out for periodically-settled fields in 1884-85. The jamabandis of 1883-84 were allowed to remain. But annual jamabandis were prepared, one for each mandal's circle. The lease numbers begin afresh in each mandal's circle, and run serially within it. The old jamabandi of 1883-84 contains the numbers shown in the periodic dág chithas of 1884-85, because the latter is an exact copy of the dág chitha of the previous year. The changes that had occurred were noted thus:—Where periodically-settled fields had been abandoned after 1883-84 the leases were corrected, and the mauzadars corrected their copies of the periodic jamabandi, and gave a memorandum, which was entered in the beginning of the annual jamabandi. and which showed the total revenue due from periodic settlement. Where fresh lands were taken up and periodically settled (I saw one case), a small addition was made to the annual jamabandi of 1884-85, and these fields were shown therein at the end as settled for nine years. The serial numbers of these leases were continued from the annual leases of the same mandal's circle. At the same time a small dág chitha was made out with a set of serial numbers of its own for these nine-year fields. Consequently, for one village there were no less than three dág chithas, one annual, one ten-year, and one nine-year, and each had its own consecutive series of numbers.

New Rules.

24. From the above, it is obvious that some change was necessary in order to introduce system into the method of numbering. This has been done in a set of supplementary Rules, which will come into operation in 1885-86, except in those mauzas where settlement was almost or quite completed before their publication. These Rules are given in detail in Appendix A.

B.—Mauzadars' Measurements.

Mauzadars' measurements.

25. During the cold weather I tested the mauzadars' measurements on 400 acres in different districts, with the result that I found excess measurements amounting to 16 and deficient measurements amounting to 20 acres.. The net result was a deficiency of 4 acres. Sub-Deputy-Collectors were employed as usual in testing measurements during the year. The following statement gives details as to the results :—

Statement of testings of mauzadars' measurements.

District.	1883-84.					1884-85.				
	Area shown by mauzadars.	Area as tested.	Percentage of errors in mauzadars' area.			Area shown by mauzadars.	Area as tested.	Percentage of errors in mauzadars' area.		
			Excess	Deficiency.	Net.			Excess.	Deficiency.	Net.
	Acres.	Acres.				Acres.	Acres.			
Goálpára	.....	.....	.....	.....	.....	4,033	4,470	1·66	12·49	—10·83
Kámrúp	91,178	91,077	1·33	1·22	+0 11	8,354	8,692	2·27	6·32	—4·05
Darrang	1,908	2,006	6·3	11·4	—5·1	1,878	1,941	1 54	4·90	—3·36
Nowgong.....	3,286	3,452	2 2	7·2	—5·0	10,791·19	11,046·02	3·06	5·41	—2·35
Sibságar	8,528	8,658	1·6	3·1	—1·5	9,760	9,817	1·2	1 8	—0·6
Lakhimpur	.....	.....	.....	.....	.....	10,959	11,309	·94	3·89	—2·95
Total	1,04,900	1,05,193	11·43	22 92	—11·49	45,775·19	47,275·02	10·67	34·81	—24·14
Average...	.....	.....	2·86	5 73	—2·87	.....	.....	1·78	5·80	—4·02

There was a considerable decrease in the total area tested, due entirely to the Kámrúp district. The reason is that the testings of 1883-84 were swelled by the large areas measured up by the tahsildars when they were first appointed. Of course, these were done once for all, and there was no necessity for similar measurements in the following year.

Testings by district officers.

26. The figures given above include areas tested by district officers as well as those done by Sub-Deputy-Collectors. Details as to the former are given below:—

Statement showing measurements made by officers other than Sub-Deputy-Collectors during 1884-85 *(in acres).*

Name of District	By Deputy-Commissioners	By Assistant Commissioners	By Tahsildars.	By mauzadars and amins	By District Surveyors.	Total area measured by officers other than Sub-Deputy Collectors.	Area measured by Sub-Deputy-Collectors.
1	2	3	4	5	6	7	8
Kámrúp	856	1,148	4,971	1,717	.....	8,692	.....
Darrang	38	532	218	67	80	935	1,006
Nowgong	385	.....	.....	.....	.....	385	10,661
Sibságar	.....	371	.....	6,432	2,663	9,466	351
Lakhimpur...	24	109	.....	7,254	546	7,933	3,376

Mauzadars' measurements often guesswork.

27. In examining mauzadars' papers it is impossible to help being struck by the apparent fact that a very large number of the measurements made by mandals are guesses. Theoretically, a mandal is supposed to measure up all four sides of every field, and to work out the area by multiplying the averages of the two lengths by that of the two breadths. In very few cases, indeed, does it occur that opposite sides are equal, and probably not one in ten thousand fields is a perfect square. Yet, the mandal treats the majority of his fields as having the opposite sides equal, and a good many as having all four sides of exactly the same dimensions. He measures up two contiguous sides, and assumes that those opposite are equal to these. Out of 587 fields which I counted, with a view to ascertain figures on this subject, I found that 68, or 11 per cent., had one pair of opposite sides equal, and that 468 (or 80 per cent.) had both pairs of opposite sides equal. In other words, in 89 per cent. of their measurements the mandals, from whose books these figures were obtained, had gone round two sides only of each field, in 11 per cent. they had gone round three sides, and in only 9 per cent. had they fairly measured up all four sides. Under these circumstances, it is surprising that their areas are even as correct as they are found to be. Of course, an excess in one case is pretty sure to be balanced (except in cases of intentional fraud) by a deficiency somewhere else, and therefore to Government the matter is not of such vital importance. But to the tenant it may sometimes be very serious, and it is little consolation to the man who is paying too much to know that probably others in the same mauza are paying too little.

Errors due to incorrect working.

28. In addition to these errors, due to laziness, are the errors due to incorrect working out of areas. These are very numerous, and affect Government and the tenant in the same way as incorrect measurements. It is hardly ever possible to work out a score of areas without finding mistakes. With a view to lessen this evil, a set of tables is being prepared, giving in bighas, kottas, lessas, and karas, all areas from 10 up to 10 lakhs of square feet. This should render almost impossible the occurrence of errors due to miscalculation.

The principles of testing.

29. Intimately connected with this subject of mauzadars' measurements is that of the principle upon which these measurements should be checked. There is a theory that the European district staff can do it. I do not believe that this theory can ever be reduced to practice. It is true that a district officer can test a large area of land during the cold weather. But this can never be more than a very small percentage on the total cultivation of his district. It is very hard work to measure up 150 bighas a day for any length of time. No district officer could keep it up for much more than half the number of days he is in camp. I will suppose that he measures up 150 bighas a day for 100 days. This is a liberal allowance, and more than most Deputy-Commissioners could accomplish. The total amount is 15,000 bighas =5,000 acres nearly. This on the total cultivation of each district would be—

	Per cent.
In Kámrúp	0·94
„ Darrang	2·65
„ Sibságar	1·52
„ Nowgong	1·82
„ Lakhimpur...	5·17

Therefore, even in the district with the smallest area of cultivation, and even with an exceptional amount of testing done by the Deputy-Commissioner, we see that he could only check 5 per cent. of the total cultivation. But, as a matter of fact, 5,000 acres per annum is much more than any Deputy-Commissioner could actually accomplish. It is probably more than the whole European staff could undertake. In paragraph 26 the amount tested by each Deputy-Commissioner is given. The following table shows the areas tested by district and sub-divisional officers in 1882-83 and 1883-84:—

	1882-83. Acres.	1883-84. Acres.
Goálpára	185	614
Kámrúp	1,517	659
Darrang	1,921	243
Nowgong	3,203	74
Sibságar	1,677	960
Lakhimpur	.....	461

The above, it must be remembered, includes the work done by Native Extra-Assistant-Commissioners, as well as that accomplished by the European staff, so that from the figures of the past three years it is evident that 5,000 acres is an excessive estimate for the testing that could be done by the European staff. But it was shown that, even with 5,000 acres, the check on the total area of cultivation was infinitesimal. Consequently, with much less actually done, it may be laid down that it is practically out of the power of the district officer to check with any effect the mauzadars' measurements in his district.

Testing agencies.

30. This being so, the question arises—how are mauzadars' measurements to be checked? Up to date three agencies have been employed:—

(*a*) Selected mauzadars.
(*b*) Amins.
(*c*) Sub-Deputy-Collectors.

Selected mauzadars.

31. By selected mauzadars those mauzadars are meant who are considered trustworthy enough to be sent to measure up the lands of men whose measurements are suspected. The selected mauzadar rarely detects any serious errors, and it is now pretty generally admitted that the system does not work. It is not easy to see how it could ever have been supposed capable of working satisfactorily. It was impossible for the selected mauzadar to avoid having a clannish sympathy with the man whose lands he was called on to measure. To the natural dislike to getting a man of his own rank and position and occupation into trouble, was added the apprehension that he might himself be similarly situated some day, and that if he brought concealed cultivation to light, errors in the measurements of his own mauza would be certain to be exposed. There was absolutely no inducement to the selected mauzadar to detect error, and every inducement to conceal it. He knew always that if through his means a mauzadar were to lose his appointment, that mauzadar and all his relatives and friends would become his deadly enemies, and that they would leave no stone unturned, no artifice unemployed, to compass his ruin. Even if he knew his own measurements to be correct, he could never be sure that concealed cultivation would not be arranged for in his mauza and then exposed. Naturally, therefore, he carefully avoided indicating serious errors.

Amins.

32. The employment of amíns, though not attended by the above objections, was unsatisfactory for other reasons. The amín received monthly pay, or was remunerated according to the area he measured. It made no difference to him whether the mauzadar's area was correct or not. He knew that his survey could not be checked. It was the mauzadar's interest that no mistakes should be found, and he naturally made it the amín's interest too.

Sub-Deputy-Collectors

33. The system of measurement by Sub-Deputy-Collectors is based on the assumption that well-paid officials who have hopes of promotion will do honest work The assumption is no doubt correct, but time alone can say how far it applies to the facts of the case. If the hopes of promotion and the fear of losing their appointments are sufficiently strong to overcome the temptations which fraudulent mauzadars are certain to throw in their way, the system will work. The chances of detection are, however, so slight that I doubt the effect of fear in keeping the Sub-Deputy-Collector straight. It will, of course, have some effect, but not much, as he knows that a very small percentage of his measurements can be tested. The hope of promotion will probably prove a more effectual deterrent. He knows that there is no chance of his ever becoming an Extra-Assistant-Commissioner if there is the slightest shadow of suspicion resting on his character. It is too early to speak as yet of the results of the system, as it cannot be expected to yield much fruit on its first introduction.

C.—Survey Schools.

Survey schools.

34. Intimately associated with the maintenance of the village records is the efficiency of the staff which is employed upon them. The schools for the training of mandals in survey which were opened in 1883 at Gauháti, Barpeta, Tezpur, Mangaldai, Nowgong, Sibságar, and Jorhát were maintained during the year under report, the only change being the transfer of the Barpeta school to Gauháti, where consequently two are now in existence. Regular rules for the management of these schools were framed and issued in October 1884 (*see* Appendix B). The principle on which they are based is that rewards are to be given to the teachers when more than 25 per cent. of the pupils passed, and fines imposed when a less number proved successful. The examinations at the same time have become somewhat stricter. All the schools were inspected by me during the year, some of them more than once, and I found that the method of holding the examinations was faulty and the results unsatisfactory. Some additional rules have since been framed, dealing with these points, and it is hoped that they will result in the attainment of greater efficiency. They are printed in Appendix C, and will come into operation in 1885-86. The statement below shows the results that have been obtained up to the 31st March 1885 :—

Name of district.	Mandals.					Munzadars.				Candidates.		Remarks.
	Total number of mandals.	Number on rolls of school on March 31st 1885.	Number with second-class certificate on March 31st 1885.	Number with first-class on March 31st 1885.	Number exempted from passing.	Total number of munzadars.	Number with second class certificates on March 31st 1885.	Number with first-class certificates on March 31st 1885.	Number exempted from passing.	Number with second-class certificates on March 31st 1885.	Number with first-class certificates on March 31st 1885	
1	2	3	4	5	6	7	8	9	10	11	12	13
Kámrúp	266	53	91	3	..	57	3	..	..	27	3	Two schools with 4 teachers.
Darrang	175	28	44	4	19	42	4	..	5	15	3	„ „ „ 2 „
Nowgong	187	09	43	2	..	44	5	1	12	8	.	One school with 1 „
Sibságar	211	45	15	..	.	63	..	..	4	2	3	Two „ „ 2 „

At the close of the financial year the system of dual control, by which the schools had been financially in the hands of the Inspector of Schools, and in all other respects under the supervision of this Department, came to a close. In the current year their cost will be met from the Agricultural Budget.

D.—Cadastral Survey.

Cadastral survey.

35. The cadastral survey continued its operations in the Kámrúp district during 1884-85, and the preparation of the settlement records was, as in the year before, directly in my charge. A special report is annually prepared for the twelve months ending September 30th to correspond with the one submitted by the Deputy-Superintendent of Survey in charge of the party. It is unnecessary, therefore, to enter into details here. It should, however, be noted that the subject thus cursorily dismissed is one of the most important at present in my hands, and occupies much more of my time than many of those which are being dealt with somewhat more at length in this report.

II.—Analysis of Districts, with reference to security from Famine.

III.—System of collection of Revenue and Rental in precarious tracts.

IV.—Measures of Protection.

Famine unknown.

36. These three heads apply only to districts where there is a possibility of the failure of the food-supply, and there is nothing to record under them, with reference to a province where scarcity is unknown, and famine practically impossible.

V.— Agricultural Experiments.

A.—Crops in General.

Character of the harvest.

37. The crop experiments will be more readily followed if some account is first given of the agricultural circumstances of the year. The following paragraphs form a brief *resumé* of the district reports as to the nature of the harvests of 1884-85.

Goálpára.—The year, on the whole, was unfavourable. *Sáli*, or transplanted rice, and mustard are the principal crops of the district. The former suffered from the comparative drought of June, July, and August, it being found in some places impossible to transplant the seedlings. Even in the Eastern Duárs, where artificial irrigation is

practised, the yield was not good. Mustard was more successful, owing to the comparatively dry weather of September and October. No doubt, also, the partial failure of the *sáli* led to an extension of the area under oil-seeds.

Kámrúp.—The deficiency in the rainfall of September and October had an injurious effect on the outturn of *sáli* rice, but was favourable to the cultivation of mustard. The *sáli* crop is represented as having averaged only from 8 to 12 annas. Broadcast rice yielded well, as a rule. Sugarcane also was successful. Mustard in the sub-division of Barpeta was almost a bumper crop.

Darrang.—Early or broadcast rice yielded well, but late or transplanted rice, owing to the short rainfall, was not on the whole as great a success. In the neighbourhood of Tezpur the outturn was fair, but the area restricted. In most of the Cachari mauzas of Mangaldai it was an average crop, but this was owing to the fact that here the ryots are, owing to the irrigation practised from hill streams, to a large extent independent of the character of the season. *Matikalai* and mustard promised well at the beginning of the cold weather, but insects attacked the latter while it was in flower, and the outturn did not realise the expectations that had been formed..

Nowgong.—The year, on the whole, was a prosperous one to the ryot. Early rice was particularly good, and the yield was nearly a full one. *Sáli* or late rice cultivation began well, but the crop was affected by the scanty rainfall of August and September, and the outturn was consequently somewhat reduced. It was only in the low-lying tracts and in those portions of the district where hill streams render irrigation possible, that the crop was really a good one. Mustard, on the other hand, was above the average, and the sugarcane crop was excellent.

Sibságar.—The harvests were, on the whole, below the average. The year was a dry one, and the *sáli* suffered in consequence. On the other hand, the cold-weather crops were good and yielded abundantly. The area under cane was larger than in the previous year, and the outturn above the average.

Lakhimpur.—The rainfall was below the average, and was, moreover, distributed very unequally. In July there was a falling off, and in the next month almost a flood in North Lakhimpur. The *sáli* seedlings were injured by both. In September and October there was a comparative drought, and in some mauzas of the sub-division there was a scarcity of rice. In the sadr sub-division the early and late rice were both fair. The winter crops were good, especially *matikalai*.

Gáro Hills.—The season, being a dry one, affected injuriously the crops grown in the plains portion of the district. In the hills themselves there is never any want of water, and the deficiency in the rainfall from July to October had no ill effect on the crops of the upland tracts. The dry rice yielded particularly well, and cotton gave a bumper crop. The absence of heavy falls of rain in the later months of the year, when the pods are bursting, was very favourable to the latter.

Khási and Jaintia Hills.—The season was remarkable as having been the dryest on record for a long series of years. The character of the rains affected the yield of lowland rice, but apparently did no injury to that grown on the uplands, which proved an average crop. Cotton is said to have been, on the whole, better than in 1883-84.

Nága Hills.—The deficient rainfall affected the outturn of early rice, which was not as good as usual. But *sáli*, which is grown principally by the Angámis, and on terraces where artifical irrigation is possible, was reported not to have suffered at all, and the fall which occurred in the price of rice would seem to confirm this statement.

Sylhet.—Taken as a whole, the season was a decided improvement on that of 1883-84. The rainfall was distributed fairly, and no heavy floods like those of May 1883 proved fatal to the hopes of the cultivator by swamping his paddy-fields. *Aman* is the staple rice crop of the district, but it is supplemented by *aus* and *sail*. *Bura* rice, which is mainly grown in Sunámganj and Habiganj, proved exceptionally good. The cold-weather crops were poor, averaging only about 8 annas over the whole district. Sugarcane, however, was a success in Habiganj, and linseed in Sunámganj. Mustard in the sadr sub-division was almost a total failure.

Cachar.—The beginning of the season was favourable, as the rains were equally distributed from April to July. The crops promised well at first, but, owing partly to a heavy fall in August, which damaged the nurseries, and partly to a deficiency in the rainfall in November, the late rice deteriorated, and though the quantity was above the average, there was a great deficiency in quality. The same cause also affected the winter harvest. Sugarcane was stunted, and mustard and pulses, which form the bulk of the Cachar winter crops, were poor.

B.—Early or Summer Rice.

38. In the Surma Valley there were altogether 87 experiments made with the object of testing the outturn of the *aus* and *boro* crops.

Surma Valley

The following statement gives the figures for the past four years:—

	1881-82.	1882-83.	1883-84.	1884-85.	Grand Total.
Number of experiments	27	54	56	87	224
Total area cut in acres	6·50	14·09	14·00	22·75	57·34
Total crop reaped in lbs.	9,210	14,040	18,048	29,727	71,025
Maximum per acre „	.....	.....	2,560	3,280	3,280
Minimum „ „	.....	.....	240	307	240
Average	1,417	996	1,289	1,306	1,238

It will be seen that the average deduced from the above figures seems low. But, on the theory of chances, it ought to be more correct than the average of any one year. Experiments like these only begin to be of value when carried on over large areas and for considerable periods of time.

39. The following statement gives separate figures for *aus* and *boro*, as well as for Sylhet and Cachar, and compares the results of 1883-84 with those of 1884-85:—

District figures.

	1883-84.				1884-85.			
	Sylhet.		Cachar.	Total.	Sylhet.		Cachar.	Total.
	Aus.	Boro.	Aus.		Aus.	Boro.	Aus.	
Number of experiments	27	15	14	56	47	32	8	87
Total area cut in acres	6·75	3·75	3·50	14	12·75	8·0	2·0	22·75
Total crop reaped in lbs.	8,581	5,259	4,208	18,048	13,329	13,077	3,321	29,727
Maximum per acre, „	1,996	2,560	2,076	2,560	2,361	3,280	2,460	3,280
Minimum „ „	392	240	544	240	307	426	652	307
Average	1,271	1,396	1,202	1,289	1,045	1,634	1,660	1,306

The total averages of the two years are almost the same, a fact which would imply their probable correctness.

40. Out of the above experiments, the great majority were carried out by Police officers. The following table shows the number that were supervised by Sub-Deputy-Collectors and officers above that rank:—

Experiments by superior officers.

	Sylhet.	Cachar.	Total.
Number of experiments	7	8	15
Total area cut in acres	1·75	2·0	3·75
Total crop reaped in lbs.	2,522	3,321	5,843
Maximum per acre „	2,164	2,460	2,460
Minimum „ „	669	652	652
Average	1,441	1,660	1,558

The average, it will be seen, is far higher than that obtained from the sum total of the experiments. The presumption is that those carried out by superior officers were more carefully made than the others, and are, therefore, probably more correct. On the other hand, it must be remembered that the area under experiment was small, and the number of experiments few.

41. In the Brahmaputra Valley 189 experiments were carried out during the year under report to ascertain the outturn of early rice. The figures below compare these with those of previous years:—

Brahmaputra Valley.

	1881-82.	1882-83.	1883-84.	1884-85.	Total.
Number of experiments	20	.....	115	189	324
Total area cut in acres	6·04	.....	38·17	69·95	114·16
Total crop reaped in lbs.	5,664	.....	52,133	95,896	1,53,693
Maximum per acre „	2,468	.....	3,007	2,828	3,007
Minimum „ „	139	.....	296	241	139
Average	937	.....	1,366	1,370	1,346

The average deduced is believed to be well within the truth, as some carefully-conducted experiments have given very much higher returns.

42. The following table gives statistics for the outturn of the Assam Valley for the two years 1883-84 and 1884-85:—

District figures.

	Goalpára.		Kámrúp.		Darrang.		Nowgong.		Sibságar.		Lakhimpur.		Total.	
	1883-84.	1884-85.	1883-84.	1884-85.	1883-84.	1884-85.	1883-84.	1884-85.	1883-84.	1884-85.	1883-84.	1884-85.	1883-84.	1884-85.
Number of experiments	8	13	33	46	22	44	18	40	27	34	10	13	118	189
Total area cut in acres	1·50	3·25	10·66	23·47	6·81	14·64	5·74	15·64	7·77	8·59	2·74	4·46	35·22	69·96
Total crop reaped in lbs.	1,966	5,820	11,963	28,568	7,078	19,890	8,071	22,178	13,862	12,490	2,828	6,950	46,372	99,896
Maximum per acre „	2,368	2,776	1,812	2,461	2,056	2,828	2,798	2,680	3,007	2,492	1,494	2,220	3,007	2,828
Minimum „ „	896	1,000	272	241	311	508	296	501	759	616	444	620	296	241
Average	1,720	1,790	1,122	1,217	1,128	1,363	1,406	1,418	1,782	1,454	1,036	1,558	1,308	1 370

The number of experiments made in 1884-85 was much greater than in the previous year, and the area dealt with much larger. The agreement between the total averages of the two years is strikingly close.

Experiments by superior officers

43. As was the case in the Surma Valley, the average outturn is higher when the experiments of superior officers alone are considered than when those of mauzadars and police officers are included. The following table, which shows only experiments by Sub-Deputy-Collectors and other officers of higher rank, brings this out very clearly:—

	Assam Valley.
Number of experiments	28
Total area cut in acres	7·81
Total crop reaped in lbs.	10,170
Maximum per acre „	2,704
Minimum „ „	604
Average	1,430

C.—Late or winter rice.

Surma Valley

44. In the Surma Valley 152 experiments were made during the year under report to ascertain the outturn of winter rice. The results of these are compared in the statement below with the figures obtained in the preceding three years:—

	1881-82.	1882-83.	1883-84.	1884-85.	Total.
Number of experiments	86	49	64	152	351
Total area cut in acres	21·5	11·75	16·20	40·83	90·28
Total crop reaped in lbs.	40,816	19,094	28,260	74,601	162,771
Maximum per acre „	5,764	2,962	3,300	3,550	5,764
Minimum „ „	537	131	436	246	131
Average	1,898	1,625	1,744	1,827	1,802

The average brought out by these figures is unexpectedly high. It is higher than that obtained in Burmah, where 1,600 lbs. per acre is believed to be the produce. It is considerably higher than the average shown below for the Assam Valley. But the number of experiments was numerous, and there is apparently no reason to regard the result with suspicion.

District figures

45. The following statement gives separate figures for *aman* and *sáli* in Sylhet and Cachar, and compares the figures for 1884-85 with those of the previous year. *Aman*, it will be remembered, is broadcast winter rice, as distinguished from *sáli*, which is transplanted:—

	1883-84.				1884-85.			
	Sylhet.		Cachar.	Total.	Sylhet.		Cachar.	Total.
	Sáli.	*Aman.*	*Sáli.*		*Sáli.*	*Aman.*	*Sáli.*	
Number of experiments	12	42	10	64	38	105	9	152
Total area cut in acres.....	3·2	10·50	2·50	16·20	10 74	27·84	2 25	40 83
Total crop reaped in lbs	6,631	16,694	4,935	28,260	14,573	55,858	4,170	74,601
Maximum per acre „	3,300	3,108	2,856	3,300	2,747	3,550	2,542	3,550
Minimum „ „	1,481	436	1,152	436	393	246	1,271	246
Average.....	2,072	1,590	1,974	1,744	1,357	2,006	1,853	1,827

Experiments by superior officers

46. Out of the large number of experiments carried out this year in Sylhet and Cachar, no fewer than 35 were superintended by officers not below the rank of Sub-Deputy-Collector. But, contrary to experience in the case of the early rice, we find that the average outturn is far below that shown by all the experiments taken together. It is difficult to account for this, except on the unsatisfactory supposition that fields below the average were selected The following statement gives details as to these experiments:—

	Sylhet.	Cachar.	Total.
Number of experiments	26	9	35
Total area cut in acres	6·82	2 25	9·07
Total crop reaped in lbs.....	8,303	2,487	10,790
Maximum per acre „	2,152	1,378	2,152
Minimum „ „	613	804	613
Average	1,217	1,105	1,190

47. In the Brahmaputra Valley 410 experiments on the outturn of *sáli* rice were performed. This is a larger number than had been attempted in any previous year. The following table gives details for the last four years :—

Brahmaputra Valley.

	1881-82.	1882-83.	1883-84.	1884-85.	Total.
Number of experiments	131	229	390	410	1,160
Total area cut in acres	37 83	69·30	121·31	125·04	353 48
Total crop reaped in lbs	59,853	101,885	183,265	196,756	541,759
Maximum per acre „	3,456	3,173	4,107	4,150	4,150
Minimum „ „	352	342	124	108	108
Average	1,582	1,469	1,510	1,573	1,532

The agreement between the averages of the several years, though not very close, is sufficiently so to justify a belief in the accuracy of the result deduced from all together. This is further strengthened when we consider the very large number of experiments performed and the extensive area over which they took place.

48. The outturn of winter rice in the Assam Valley is shown below for the year under report, district by district, and compared with that of 1883-84:—

District figures.

	Goálpára.		Kámrúp.		Darrang		Nowgong.		Sibságar.		Lakhimpur.		Total.	
	1883-84.	1884-85.	1883-84.	1884-85.	1883-84.	1884-85.	1883-84.	1884-85.	1883-84.	1884-85.	1883-84.	1884-85.	1883-84.	1884-85.
Number of experiments	20	20	95	60	77	138	24	49	105	119	69	24	390	410
Total area cut in acres.....	8·02	5·97	31·39	32·2	21 79	43·59	7·01	16·19	33·33	39·14	19·72	6·95	121·31	144·04
Total crop reaped in lbs.....	15,336	12,107	40,119	32,336	29,465	67,962	13,110	26,905	52,856	46,256	32,379	11,190	1,83,265	1,96,756
Maximum per acre „	3,240	3,116	2,713	3,025	2,489	4,130	3,111	3,348	3,888	2,507	4,107	2,711	4,107	4,150
Minimum „ „	1,356	108	124	481	249	160	532	340	460	328	494	221	124	108
Average.....	1,912	2,028	1,279	1,398	1,352	1,559	1,870	1,661	1,583	1,182	1,642	1,610	1,510	1,573

There are considerable differences in the above figures from district to district. Goálpára shows the highest average in both years, Kámrúp the lowest in 1883-84, and Sibságar the lowest in 1884-85. The final averages are, however, sufficiently close.

49. The number of experiments performed by Sub-Deputy-Collectors and officers above that rank is shown in the statement below:—

Experiments by superior officers.

	Goálpára.	Kámrúp.	Darrang.	Nowgong.	Sibságar.	Lakhimpur.	Total.
Number of experiments	7	11	42	6	10	8	84
Total area cut in acres	1·75	6·00	10·85	1·96	3·12	2	25·68
Total crop reaped in lbs ...	3,405	10,637	13,524	4,492	4,035	2,804	38,897
Maximum per acre in lbs...	3,608	2,306	2,410	2,836	3,061	1,996	3,608
Minimum „ „ „ ...	108	1,259	164	1,302	790	221	108
Average	1,948	1,772	1,246	2,291	1,293	1,402	1,514

As we saw in the Surma Valley, the presumably more carefully made experiments would seem to indicate a lower average outturn per acre than the total number of experiments taken together.

50. Some experiments made in the Khási and Jaintia Hills would appear to show that the average outturn of hill winter rice is not the same as that of the species grown in the plains. Details of these experiments are given in the statement below, and compared with those for previous years :—

Hill rice.

	Upland rice.			Lowland rice.			Total for three years.	
	1882-83.	1883-84.	1884-85.	1882-83.	1883-84.	1884-85.	Upland.	Lowland.
Number of experiments	15	10	49	16	18	35	74	69
Total area cut in acres	3·75	2·50	12·25	4	4·50	8·75	18·50	17 25
Total crop reaped in lbs.....	3,355	1,242	11,385	6,779	5,171	8,844	15,982	20,794
Maximum per acre „	1,400	658	1,691	3,291	1,666	2,419	1,691	3,291
Minimum „ „ „	471	362	336	831	576	369	336	369
Average.....	895	497	929	1,695	1,149	1,011	864	1,205

51. Three experiments which I made on the outturn of winter rice in the Mangaldai sub-division gave the following averages per acre:—

Director of Agriculture's experiments.

	Pounds.
First experiment	3,435
Second „	2,618
Third „	2,543
Average	2,865

D.—Mustard.

Mustard.

52. Experiments in rice can be made with comparative facility: the grain need never be watched for more than one night. Mustard, however, cannot be threshed as soon as it is cut: it must be left to dry for some 15 or 20 days after it is pulled up, and before threshing can begin.

Surma Valley.

53. In the Surma Valley 33 experiments were made during 1884-85 The following table compares the details of these with those of the preceding three years :—

	1881-82.	1882-83.	1883-84.	1884-85.	Total.
Number of experiments	21	15	46	33	115
Total area cut in acres	5·5	3·83	14·88	10·9	35·11
Total crop reaped in lbs	1,523	1,539	6,941	3,975	13,978
Maximum per acre „	.....	1,069	1,695	943	1,695
Minimum „ „	.....	164	77	86	77
Average in lbs	277	401	466	365	398

The average is low, and very probably below the truth.

Brahmaputra Valley.

54. In the Brahmaputra Valley the average of the last four years shows an outturn of 504lbs. to the acre. This is exhibited in detail below :—

	1881-82.	1882-83.	1883-84.	1884-85.	Total.
Number of experiments	47	113	133	209	502
Total area cut in acres	13·96	37·42	51·13	68·97	171·48
Total crop reaped in lbs	4,986	16,914	27,315	37,255	86,470
Maximum per acre „	960	1,194	1,878	1,116	1,878
Minimum „ „	82	36	74	64	36
Average in lbs	357	452	535	540	504

This, of course, is over lands of all kinds, whether cropped once or twice, or for three years.

Three year rule.

55. It is universally believed by the peasantry of the Province that mustard cannot be grown on any land for more than three consecutive years, as the yield gradually falls off after the first year. To ascertain whether figures would bear out this theory, district officers were requested to state in their returns how long each field had been under cultivation. Except in Sylhet and Goálpára, where they were partially attended to, these instructions were generally carried out. The result is embodied in the statements below :—

First-year crop, 1884-85.

	Sylhet.	Cachar.	Total Surma Valley.	Goálpára.	Kámrúp.	Darrang.	Lakhimpur.	Sibságar.	Nowgong.	Total Brahmaputra Valley.	Grand total both Valleys.
Number of experiments	3	...	3	17	23	8	10	20	11	89	92
Total area cut in acres	·88	...	·88	5·62	7·6	2·78	3·26	6·61	3·51	29·38	30·26
Total crop reaped in lbs	497	...	497	3,749	2,752	1,185	2,573	4,629	1,859	16,747	17,244
Maximum per acre „	943	...	943	1,116	706	992	1,023	1,116	837	1,116	1,116
Minimum „ „	272	...	272	472	64	217	589	254	273	64	64
Average	565	...	565	667	362	426	789	700	529	570	570

Second-year crop, 1884-85.

	Sylhet.	Cachar.	Total Surma Valley.	Goálpára.	Kámrúp.	Darrang.	Lakhimpur.	Sibságar.	Nowgong.	Total Brahmaputra Valley	Grand total both Valleys.
Number of experiments	13	4	17	12	19	11	8	18	11	79	96
Total area cut in acres	4·27	1·32	5·59	3·97	6·25	3·64	3 15	5 95	3·64	26 6	32·19
Total crop reaped in lbs	1,108	524	1,632	2,131	2,304	1,907	2,505	2,922	2,184	13,953	15,585
Maximum per acre „	830	472	830	992	818	992	1,035	849	837	1,035	1,035
Minimum „ „	86	353	86	248	80	143	606	191	372	80	80
Average	259	397	292	537	369	524	795	491	600	525	484

Third-year crop, 1884-85.

	Sylhet.	Cachar	Total Surma Valley.	Goálpára.	Kámrúp.	Darrang.	Lakhimpur.	Sibságar.	Nowgong.	Total Brahmaputra Valley.	Grand total both Valleys.
Number of experiments	1	2	3	10	12	4	1	1	6	34	37
Total area cut in acres	·33	·66	·99	3·31	3·97	1 32	·33	·33	1 98	11 24	12·23
Total crop reaped in lbs	143	217	360	1,716	1,715	337	96	205	875	4,944	5,304
Maximum per acre „	143	382	382	868	932	341	289	620	620	932	932
Minimum „ „	...	273	273	248	93	96	...	...	320	93	93
Average	433	329	364	518	432	255	291	621	442	439	434

The figures for the Brahmaputra Valley and those showing totals for both valleys confirm the theory in question. In the former the rate of decrease is 570 lbs. in the first year, 525 lbs. in the second, and 439 in the third. For the latter the figures are 570, 484, and 434 lbs. Amongst the districts Goálpára and Cachar alone support the theory. This is a beginning, but it will take a long time and very many experiments before we shall be able to say from statistics how far the popular belief is founded on fact.

E.—Sugarcane.

Sugarcane.

56. Experiments to test the amount of sugar obtainable from an acre of cane are by far the most troublesome of any undertaken to gauge the producing power of land. All the processes connected with the making of the sugar, the cutting of the cane, the crushing of the stalks, the boiling of the juice, the cooling of the *gur*, are so tedious that a single experiment can rarely be done under five or six days. To ensure accuracy of course the whole operation must be watched from start to finish, and this can only be done at night with the help of a guard. Under the circumstances, I am doubtful if much reliance can be placed on the reports of mauzadars or subordinate police officers, and I am inclined to think that a few experiments done carefully by District officers are of far more value than many times the number carried out under the superintendence of mauzadars.

Experiments by inferior officers

57. However, as the experiments were made, I give them below for what they are worth. For the sake of convenience, details of both valleys are shown in the same statement :—

Experiments by Mauzadars and Police Officers.

District.	Number of experiments		Total area.		Total weight of cane.		Total weight of juice.		Total weight of gur.		Weight of gur per acre.		Pounds of juice per 100 lbs. of cane.		Pounds of gur per 100 lbs. of cane.		Pounds of gur per 100 lbs. of juice.	
	1883-84.	1884-85.	1883-84.	1884-85.	1883-84.	1884-85.	1883-84.	1884-85.	1883-84.	1884-85.	1883-84.	1884-85.	1883-84.	1884-85.	1883-84.	1884-85.	1883-84.	1884-85.
Sylhet	9	13	·74	2 6	20,889	73,029	12,161	21,308	1,839	3,884	2,485	1,492	58 2	29 58	8·8	5 36	15 13	18·08
Cachar	4	..	12	..	5,050	....	2,682	....	355	..	2,892	..	53 1	..	7	..	13·23	..
Total Surma Valley.	13	13	·86	2 6	25 939	72,029	14,833	21,308	2,194	3,884	2,551	1,492	57 18	29 58	8·2	5 36	14·84	18·08
Kámrúp	15	15	..	3 11	41,890	57,474	21,302	24 140	4,607	4,509	..	1,478	50 8	42·	11·	8·	21·62	19 05
Darrang	4	17	..	2 62	11,345	49,762	5,940	37,929	926	4,733	..	1,806	52 7	56 13	8 1	9 51	23 8	16·95
Nowgong	6	30		5 19	11,276	78,717	6,643	41,791	1,007	5,892	..	1,135	58 9	53 09	8 8	7 48	15 16	14 09
Sibságar	17	45	..	4 15	20,077	1,16,988	10,672	55,212	1,992	10,107	..	2,435	53 1	47·21	9 9	8·64	18 67	18·3
Lakhimpur	5·	15	..	1·85	5,421	59,037	1,850	24,048	355	3,987		2,155	48 2	46 21	10 5	7 66	21 39	16·6
Total Brahmaputra Valley	47	122	..	16 92	88,017	3,54,928	44,215	1,73,120	8,887	29,318	..	1,732	50·23	48·7	10 09	8 26	0 09	16 9
Grand Total for Province.	60	135	·86	19·52	1,13,956	4,26,957	59,048	1,94,428	11,081	33,172	2,551	1,099	51 81	45 54	9 7	7·7	17·9	17·06

58. In Cachar all the experiments in 1884-85 were made by Sub-Deputy-Collectors and officers above that rank. Below is given for comparison a statement similar to that above, and which shows the percentages and outturn arrived at from more carefully conducted experiments :—

Experiments by superior officers.

Experiments by Sub-Deputy-Collectors and Officers above that rank.

District.	Number of experiments.		Total area.		Total weight of cane.		Total weight of juice.		Total weight of gur.		Weight of gur per acre.		Pounds of juice per 100 lbs. of cane.		Pounds of gur per 100 lbs. of cane.		Pounds of gur per 100 lbs. of juice.	
	1883-84.	1884-85.	1883-84.	1884-85.		1884-85.	1883-84.	1884-85.	1883-84.	1884-85.	1883-84.	1884-85.	1883-84.	1884-85.	1883-84.	1884-85.	1883-84.	1884-85.
Sylhet	..	..	..	..	.....	.....	.....	.....	.....	.....	..	..	..	..	..	..	..	..
Cachar	..	5	..	·21	.....	6,824	.....	2,938	.....	653	..	3,109	..	43·05	..	9·56	..	22·22
Total Surma Valley.	..	5	..	·21	.....	6,824	.....	2,938	.....	653	..	3,109	..	43·05	..	9·56	..	22·22
Kámrúp	2	6	..	·37	2,174	11,328	605	4,949	132	1,146	..	3,097	28·	43·68	6·	10·11	21·82	23·15
Darrang	9	..	..	..	14,362	.....	7,162	.....	1,300	.....	..	.....	50·	.....	9·	.....	18·15	.....
Nowgong	..	4	..	·43	.....	9,922	.....	4,003	.....	658	..	1,571	.....	40·34	.....	6·63	.....	16·44
Sibsagar	7	1	..	·016	5,562	817	2,778	420	450	72	..	4,500	47·6	51·4	7·7	8·81	16·19	17·14
Lakhimpur	2	..	..	..	73,975	.....	27,066	.....	6,007	..	..	..	37·3	..	8·17	..	21·79	..
Total Brahmaputra Valley.	20	11	..	·866	96,873	22,067	38,111	9,372	7,889	1,876	..	2,166	39·5	42·4	8·18	8·80	20·70	20·01
Total for Province.	20	16	..	1·076	96,873	28,891	38,111	12,310	7,889	2,529	..	2,350	39·5	42·90	8·18	8·76	20·70	20·54

Results deduced.

59. The net result of the above statements may be thus expressed:—

A.—From inferior Officers' Experiments.

(*a*) The weight of *gur* per acre is between 1,699 and 2,551 lbs.
(*b*) Cane yields between 45 and 51 per cent. of its weight of juice and between 7·7 and 9·7 per cent. of its weight of *gur*.
(*c*) The juice yields between 17·06 and 17·9 per cent. of its weight of *gur*.

B.—From Superior Officers' Experiments.

(*a*) The weight of *gur* per acre is 2,350 lbs.
(*b*) Cane yields between 39 and 42 per cent. of its weight of juice, and between 8·18 and 8·76 per cent. of its weight of *gur*.
(*c*) The juice yields between 20·54 and 20·70 per cent. of its weight of *gur*.

60. To institute a comparison with products elsewhere, it is necessary to recollect what is meant by the word *gur*. *Gur* in Assam is not a hard compost like that known in Upper India. It is a syrup more or less thick, containing crystals of sugar. It is never worked up into hard balls, but is sold in earthen pots. *Gur* in Assam retains a good deal of the water contained in the raw juice. *Gur* in Upper India retains none.

Gur—molasses.

Outturn in other parts.

In the Punjab the following figures are believed to approximate to the truth:—

(*a*) The weight of *gur* per acre is 1,558 to 1,640 lbs.
(*b*) Cane yields about 59 per cent. of its weight in juice and about 10 per cent. of its weight in *gur*.
(*c*) Juice yields about 24 per cent. of its weight in *gur*.

In Burmah the estimates are as follows:—

(*a*) The weight of *gur* per acre varies from 2,482 lbs. to 3,452 lbs.
(*b*) Cane yields about 48 per cent. of its weight in juice and 8 per cent. of its weight in *gur*.
(*c*) Juice yields about 18 per cent. of its weight in *gur*.

In the North-Western Provinces the following figures have been given as approximately true:—

(*a*) The weight of *gur* per acre is 2,460 lbs.
(*b*) Cane yields 50 per cent. of its weight in juice and 9 per cent. of its weight in *gur*.
(*c*) Juice yields about 18 per cent. of its weight in *gur*.

F.—Miscellaneous Experiments.

Miscellaneous experiments.

61. Besides the above, a few miscellaneous experiments were also carried out. The following statement gives details of these:—

Crop	Matikalai.					Wheat.	Cotton (uncleaned).
Year	1883-84.	1884-85.			Total of two years.	1884-85.	1884-85.
District	Sibságar.	Goálpára.	Sibságar.	Total.		Goálpára.	Nowgong.
Number of experiments	5	3	19	22	27	9	2
Total area cut, in acres	1·25	·75	6·28	7·03	8·28	2·25	·66
Total crop reaped, in lbs.	993	199	3,219	3,418	4,411	1,185	304
Maximum per acre „ „	1,400	322	1,066	1,066	1,400	1,025	511
Minimum per acre „ „	261	201	155	155	155	246	408
Average	794	265	512	486	533	526	461

The data are too few as yet to warrant any definite conclusions, but they are recorded for comparison with the figures of future years. Wheat is almost certainly too low. In the North-West Provinces the average on reasonably good land is about 1,100 lbs. In England a farmer will consider himself badly off if he does not get at least 30 bushels, equivalent to 1,830 lbs.

Outturn of cotton.

62. The outturn of uncleaned cotton is remarkable, as it is far higher than the averages of other Provinces. Taking 5:2 as the ratio of uncleaned to cleaned, a ratio which has been repeatedly proved in Assam to be well within the mark, we get from 461lbs. of uncleaned, 184lbs. of cleaned cotton to the acre. In the North-West Provinces the best estimates give only 65 lbs. In Hyderabad the produce is believed to be no higher than 25, and in the Punjab but 103lbs. The Assam outturn, however, has been verified by repeated experiments in former years, and it is believed that the estimate taken as correct in the last report on cotton, *viz.*, 150 lbs. to the acre, is really below the actual truth.

Final outturn.

63. The following table shows succinctly for the principal Assam crops the outturn in lbs. per acre, which upon data at present available is believed to be correct. Where it differs from any of the figures above given, the difference is due to a careful consideration of the relative value of the experiments. In all cases it is assumed that the crops are fair average crops, such as a cultivator might reasonably expect from average soil in the absence of any special vicissitudes of season. Estimated in annas, where 20 annas would be taken as a bumper crop, 16 annas would express the value. The figures are in all cases given in the nearest round numbers below what is probably the truth:—

	Early rice.	Late rice.	Mustard.	Undrained sugar.	Matikalai.	Wheat.	Cotton cleaned.
Average outturn per acre in lbs. of a 16-anna crop, where 20 annas means a bumper.	1,300 (probably too low.)	1,600	450	1,900	500	500 (certainly too low.)	150 (probably too low.)

Experimenting officers.

64. The following statement gives the names of the superior officers who carried out experiments, with the number and nature of the experiments done by each :—

Serial No.	Name.	Wheat.	Mustard.	Early rice.	Late rice.	Cane.	Cotton.	Total.
1	H. R. Brown, Esq., Assistant-Commissioner, Sibságar.	...	3	...	2	3	...	8
2	W. G. Black, Esq., ditto, Cachar.....	...	1	...	2	1	...	4
3	G. B. Havelock, Esq., District Superintendent of Police, Nowgong.	...	...	...	2	1	...	3
4	G. E. McLeod, Esq., Sub-divisional Officer, Mangaldai.	...	...	...	1	1	...	2
5	Major H. J. Peet, Deputy-Commissioner, Khási and Jaintia Hills.	...	...	...	12	...	...	12
6	G. Godfrey, Esq., C.S., Deputy-Commissioner, Lakhimpur.	...	...	...	5	...	...	5
7	S. J. Douglas, Esq., C.S., Sub-divisional Officer, Habiganj.	...	...	...	4	...	...	4
8	A. Porteous, Esq., C.S., Assistant-Commissioner, Sylhet.	...	...	...	2	...	...	2
9	H. H. Metcalfe, Esq., Sub-divisional Officer, Goálpára.	...	1	...	...	...	...	1
10	A. C. Campbell, Esq., Deputy-Commissioner, Kámrúp.	...	...	...	1	...	...	1
11	F. St. C. Grimwood, Esq., C.S., Sub-divsional Officer, North Lakhimpur.	...	...	...	1	...	...	1
12	J. J. S. Driberg, Esq., Deputy-Commissioner, Nowgong.	...	...	...	...	...	2	2
13	Babu Nritya Gopal Chatturji, B.L., Extra-Assistant-Commissioner, Cachar.	...	1	...	4	1	...	6
14	„ Harish Chandra Chaki, ditto, Dhubri.	6	6	...	3	...	...	15
15	„ Ram Gopal Khan, ditto, Goálpára...	...	3	...	3	...	...	6
16	„ Jagat Chandra Das, ditto, Nowgong	...	2	...	2	...	...	4
17	„ Kedar Nath Sanyal, ditto, Sylhet ...	...	...	...	6	...	...	6
18	„ Shambhu Narayan Singh, ditto, Sylhet.	...	...	...	5	...	...	5
19	„ Kanti Chandra Mukharji, ditto, Sibságar.	...	...	...	5	...	...	5
20	„ Ishan Chandra Patranavis, ditto, Sylhet.	...	...	...	3	...	...	3
21	„ Madhub Chandra Bordoloi, ditto, Darrang.	...	...	...	2	...	...	2
22	„ Jagat Bandhu Nag, B.L., ditto, Cachar.	...	...	...	2	...	...	2
23	Maulavi Hamid Bukht Mazumdar, ditto, Sylhet.	...	...	...	2	...	...	2
24	Babu Fatik Chandra Barua, Sub-divisional Officer, Barpeta.	...	...	...	2	...	...	2

G.—Wheat.

Wheat.

65. In return for a box of 4 maunds of rice of different kinds sent to the South Australian Committee of the Calcutta Exhibition in 1884, a consignment of wheat was received from Australia. As it arrived too late for the sowings of October 1884, it was sent up to Shillong, and will be distributed to cultivators in the Goálpára district during the current year.

II.—Sorgho.

Sorgho

66. In February 1884, 2 maunds of sorgho were received from the North-Western Provinces, and distributed to the Deputy-Commissioners of Lakhimpur, Sibságar, Nowgong, and Darrang, half-a-maund to each. In Lakhimpur the seed was sown in April, and three months after, the crop was gathered. No attempt was made to extract sugar, as the rain did serious injury. Mr. Grant, of Cumatoliah, was partially successful. He used the stalks as fodder, and found that the grain was appreciated by his coolies. In Sibságar, for some unaccountable reason, scarcely any of the seed germinated, and the experiment was a dead failure. In Darrang Dr. Campbell found that the yield of grain amounted to a little over 6 maunds per acre. Owing to a misunderstanding, no sugar was made from the stalks. In Nowgong some of the grain was distributed to mauzadars, and some was tried in April in the jail garden, where Babu Nandeswar Phukan made the most successful experiment

of the year with this crop. A small patch (1,696 square feet) only could be sown, but this yielded grain at the rate of 15 maunds 16 seers (1,262 lbs.), unstripped canes at the rate of 346 maunds (254 cwt.), stripped canes at the rate of 205 maunds (151 cwt.), and *gur* (the usual semi-liquid kind used in the Province) at the rate of 738 lbs. per acre. The average length of the canes was 5 feet 7 inches. The actual cost of the experiment was Rs. 3-10, and the value of the grain and *gur* produced Rs. 4; but of course on a larger scale the proportional cost would be materially reduced, while the proportional value of the outturn would remain the same.

67. Sorgho possesses some advantages which may render it a popular crop:

Advantages of sorgho.

(1) It is grown with ease on poor soil, careful ploughing and manuring not being necessary.
(2) It occupies the ground for only 3 to 3½ months.
(3) It yields an edible grain as well as a supply of sugar.
(4) The latter comes into the market much before ordinary cane sugar.

Another advantage which is sometimes claimed for it, *viz.*, that cattle will eat the megass, was not found to be the case at Nowgong. This may be, however, because the bullocks were not used to it. All cattle will not take to cotton-seed or oil-cake when these are first offered, though most will eat these commodities greedily when once the taste for them has been acquired.

A further supply of seed was distributed early in 1885, and the result will be embodied in next year's report.

I.—Potatoes.

68. Experiments in potato cultivation have been in progress for some years in the Province. In the beginning of 1882, 34 maunds 22 seers of Kumaon acclimatised English potatoes were received and sown as a summer crop in the Khási and Jaintia Hills. The outturn was 204 maunds 22 seers. Out of this, 11 maunds 1 seer (being half the crop) was retained by the private persons to whom 6 maunds 10 seers had been distributed, and the balance, 193 maunds 21 seers, put aside for further experiment. The result of this trial was undoubtedly unsatisfactory. In the hands of private persons, the yield had been only about 3½-fold. In the jail better results had been obtained, for there 28 maunds yielded 182 maunds 20 seers, or 6½-fold. The tradition in the Khási Hills is that potatoes yield five-fold, so that the new variety did not appear much superior to those already established. Out of the total amount harvested (193 maunds 21 seers), 88 maunds were redistributed for sowing in the winter of 1882-83, 25 maunds 3 seers sold, and the balance, 80 maunds 18 seers, retained for summer sowings in 1883. The 88 maunds are stated to have resulted in total failure, except at the jail, where 19 maunds yielded exactly the same amount. A fresh supply of 17 maunds of potatoes from Kumaon was received at the close of 1882. These were originally intended for Kohima and Manipur, but, 4 maunds being found rotten and the 13 maunds left being reported unfit to travel so far, it was resolved to retain them for sowing in the Khási Hills, and to send out instead the produce of the previous consignment of Kumaon seed. Accordingly, the 13 maunds were added to the 80 maunds 18 seers already in stock, and from the latter the following issues were made in the cold weather of 1882-83:—

Khási Hills experiments.

	Mds.
To Political Agent, Manipur	7
„ Sub-divisional Officer, North Cachar	30
„ Deputy-Commissioner, Nága Hills	10
„ A. J. Mein, Esq., Deputy-Conservators of Forests	1
Total	48

To the balance (45 maunds 18 seers) was added at the close of the cold weather, the 19 maunds produced in the garden of the Shillong Jail, but this was an addition in name only, as 19 maunds 1 seer had rotted during the winter, and had to be thrown away. The balance, 45 maunds 17 seers was, with the exception of 1 maund sent at the close of the year to the Assistant Political Officer, Sadiya, distributed for the summer sowings of 1883. The total result of this was 186 maunds 30 seers, or less than 4½-fold. Again, the produce in the Shillong Jail was far the best, being 89 maunds 10 seers for a seed weight of 13 maunds 30 seers, or nearly seven-fold. Out of the total amount of 186 maunds 30 seers produced in the summer of 1883, 15 maunds 10 seers were sown for a winter crop, and are reported to

have been a total failure. Out of the remainder kept for summer sowings, 48 maunds 3 seers are said to have been found rotten, 7 maunds 2 seers were sold, 20 seers were sent to Gauháti, 10 maunds to Jowai, and 30 maunds consumed in the jail. This accounts for 110 maunds 35 seers. The balance, 75 maunds 35 seers, was sown in February and March 1884, and the reported produce was 235 maunds 29 seers, or very little over three-fold. This was the smallest outturn obtained in any summer experiment, and, if correct, would seem to prove that Kumaon potatoes are not suited to these hills. The best result in any individual experiment was obtained, as usual, at the Shillong Jail, where 27 maunds 3 seers weight of seed produced 132 maunds 10 seers of tubers. Out of the whole amount harvested, 7 maunds were again tried without success as a winter crop in 1884-85, 4 maunds 16 seers sold, 54 maunds 10 seers consumed, 10 maunds sent to the Assistant Political Officer, Sadiya, 29 maunds 10 seers found rotten, and 130 maunds 33 seers held over for summer sowings in 1885.

Scotch Champions

69. Besides the above, a small consignment of a special variety of Scotch Champion potatoes was received from the North-Western Provinces Government in December 1882. Out of 20 seers, 18 were found fit for sowing. They were put down in February 1883, and the outturn was 1 maund 27 seers. Out of these, 7 seers were rejected, and 1 maund 20 seers were put down in September 1883. The outturn was 1 maund 5 seers. In February 1884 a further sowing of one maund was made from the above (the balance being rotten), and 4 maunds was the result. Out of this 20 seers were sown in the jail garden, and the outturn is said to have been only 8 seers. Therefore, in the beginning of 1885, 3 maunds 28 seers were in hand. But of this, 2 maunds 38 seers were found rotten, and the balance, 30 seers, was put down in February for a summer crop in 1885.

Manipur experiment

70. To Manipur a consignment of 7 maunds of potatoes locally raised from Kumaon seed had been sent in January 1883. The Political Agent kept 26 seers for his own garden, and distributed the remainder to the Rája's officials, with a request that details might be furnished of the outturn. No details whatever were kept, and the experiment may be regarded as a failure. In Major Trotter's own garden in the valley 14 seers produced 2¼ maunds, and 12 seers tried at a hill garden also gave 2¼ maunds. One maund was reserved for seed, but during the Political Agent's absence in Calcutta on Exhibition work, the potatoes rotted. The outturn, however, as far as ascertainable, was over seven-fold.

North Cachar experiments

71. Out of the 30 maunds of seed sent to the Sub-divisional Officer, North Cachar, at the end of 1882, 15 maunds sent *viâ* Sylhet rotted, but the remainder, forwarded *viâ* Jowai, arrived in good condition. At Gunjong (elevation 2,200 feet) 9 maunds were put down at once, and the produce in February and March was 31 maunds of potatoes larger sized than those which furnished the seed. The rest of the experiments at higher elevations was a failure.

In Gunjong 30 maunds were early, in 1883, distributed amongst the neighbouring villages with instructions to sow in the summer. But the heavy rains of that year proved fatal to almost the whole of the crop, with one notable exception, where it was found that for every seer planted 15 seers had been got. No experiment was made in the winter of 1883-84 or the rains of 1884, but in September of that year a consignment of 25 maunds of Khási potatoes was sent to the sub-divisional officer, who put down—

	Mds.	Srs.	Elevation.
At Gunjong	1	39	2,200 feet
„ Guilong	3	0	3,666 „
„ Hungram	3	0	4,400 „
„ Ninglo	3	0	5,000 „
„ other places	5	28	1,500 to 2,000 „
	16	27	

The balance was left for the summer of 1885. At Gunjong the winter yield was 4 maunds 17 seers, or a little over two-fold. It was found that a species of red-ant had bored the tuber through and through. The Guilong crop was an utter failure, the outturn small, and the tubers of poor quality. At the other places the crop had not been taken up at the close of the year.

Mr Mein's experiment.

72. The Deputy-Conservator of Forests, Gauháti, received one maund in December 1882. The potatoes were put down at once in good soil near the Kulsi river, but the result was a failure, as the outturn was only 7 seers. Mr. Mein attributes this result to the time of year at which they were sown, September being the more usual month, and also to the fact that the land was not sufficiently deeply trenched.

Naga Hills experiment.

73. The ten maunds sent in January 1883 to Kohima in the Nága Hills bore the journey very badly. Only three maunds were fit to be sown, and these yielded but six maunds of tubers much inferior to the original kinds. It is supposed that the soil at Kohima is unsuitable, as private attempts to raise potatoes have also, it is said, invariably failed.

Sadiya experiment.

74. In December 1883 one maund was sent to the Assistant-Political Agent, Sadiya. Only 15 seers were found fit to sow, and from these only 26 seers resulted. It is believed that the poor outturn was due to ignorance on the part of the cultivators as to the method of growing the crop. A fresh supply, consisting of 10 maunds of seed, was sent in September 1884, out of these 8 maunds 13 seers were found fit for sowing. These were all distributed amongst 73 tenants and sown in December. The yield amounted to only 26 maunds 30 seers, or about three-fold, but the quality was superior to that of ordinary Sadiya potatoes. This fact does not, however, seem to have been appreciated by the ryots, whom, moreover, the Assistant-Political Officer could not induce to cultivate the crop according to the instructions he gave.

The ten maunds sent to Jowai in the winter of 1883-84 are reported to have been a total failure, but no details of the experiment have been furnished.

Object of the experiments.

75. The idea that underlay all the above efforts was the improvement of the variety in places like Manipur, Sadiya, and the Khási Hills, where potatoes are already grown, and the introduction of the tuber into places like the Nága and Cachar Hills, where they are unknown. There seems some prospect of success in Cachar and in the Khási Hills. There is absolutely no reason why potatoes should not succeed in the latter. They are regularly grown by the Khásis and exported in large quantities, and it seems absurd to say that an improved variety cannot be introduced.

Present system improveable.

76. But I do not think the experiment should be conducted upon the lines hitherto adopted. The plan has been to grow a certain quantity each year in the jail garden, and to distribute the remainder to those who care to grow, on the understanding that one-half the produce is to belong to the cultivator. In the first year distribution was actually made. Afterwards, the whole amount of the crop was allowed to remain in the cultivator's hands, and he was simply directed to resow a certain amount, the quantity not being specified. He, of course, did what he liked, and furnished to the Deputy-Commissioner, when interrogated, whatever figures suited his convenience. There was practically no check over either sowing or outturn, and it is more than probable that in many instances the actual outturn was never really ascertained, but guessed at and estimated almost certainly much below the truth. In this connection it is curious to notice that in those experiments where presumably some intelligent supervision was exercised, *i.e.*, at the Shillong Jail, and in the Political Agent's garden at Manipur, the majority of the results were far more favourable than those of independent cultivators.

Results of the experiments.

77. It would seem, however, notwithstanding the unreliableness of a great many of the returns, that two things may be regarded as possibly true. One is that Kumaon potatoes do not seem to keep well through the winter in Shillong. I have been assured that great care was taken, and that the potatoes were stored on wooden benches above the ground, but that invariably a large proportion rotted. Secondly, it would appear that Kumaon potatoes do not grow well in the winter here. I am unable to account for this. The winter crop has been invariably reported a failure. Khási potatoes do well both summer and winter, and there would seem to be no reason why a potato which comes from a colder climate and grows freely in the summer here should fail in the winter. I think, therefore, that these experiments should not be given up. But I would change the procedure.

Selection of seed.

78. The principle to be insisted on is that seed should each year be selected. It is suicidal to sell the best potatoes and keep only little ones for seed. The exact opposite should be done. The work of selection would be neither laborious nor tedious. A picked quantity should thus be sown year after year, the balance of each year's crop being sold off at the market rate. After a time it would be found, if the selection had been intelligently made, that the variety had improved. When this fact was appreciated, and the Khásis are always ready to adopt a profitable idea, the produce of the jail garden would command for seed a higher price in the market than ordinary potatoes, and a great step would have been taken to advance potato cultivation in Assam.

J.—The Habiganj Agricultural Show.

79. The second annual *mela* at Habiganj in Sylhet was opened on 30th December 1885 and closed on 11th January. It appears to have been found profitable by the shopkeepers, and to have been appreciated by all who attended; but the Agricultural Show that was held in connection with it cannot be regarded as having been a success. There were four divisions into which all exhibits were divided:—

Habiganj Agricultural Show.

(1) Live stock.
(2) Agricultural implements.
(3) „ produce.
(4) Local manufactures.

The last was the best represented. It was found almost impossible to induce the ordinary ryot to come forward, and the exhibitors were, therefore, mainly Bengali landholders of the neighbourhood. A model of a new rice-husking machine was exhibited on behalf of the ward's estate, but on a competitive trial with the ordinary "*dheki*" and "*gail*" of the country, it did not prove its superiority over those ancient and well-known implements. The expenditure on the whole *mela* amounted to Rs. 2,790-3-9. The receipts were as follows:—

	Rs.	As.	P.
Voluntary subscriptions	1,945	2	9
Hire of shops	434	9	0
Unexpended balance of previous year	648	1	3
	3,027	13	0

K.—Forecast of Crops.

80. An attempt was made in January 1885 to issue a forecast of the mustard crop of the Brahmaputra Valley. The circular prescribing what was to be done issued from this office on the 6th January. The dág chithas for the supplementary settlement are due in the office of each Deputy-Commissioner on the 15th January, and, as they contain the main part of the information required, it was anticipated that no difficulty would be experienced in forwarding by 20th January the statements that had been called for. The gathering of the mustard crop begins in December, and continues through January and part of February. The forecast, therefore, to be of any use, should have been issued in January. The following list shows the dates on which complete returns were received from each district:—

Forecast of crops.

Nowgong	21st February.
Darrang	28th „
Goálpára	4th March.
Sibságar	22nd „
Lakhimpur	7th April.
Kámrúp	3rd June.

Under the circumstances, the preparation of the forecast had to be abandoned. Another attempt will be made next year.

VI.—Cattle-breeding and Veterinary Establishments.

81. This subject has not been taken up yet.

VII.—Agricultural and Fiscal Statistics.

A.—Return XLI. B.

82. The preparation of Return No. 41B. for the whole of the Province was assigned to this Department by Chief Commissioner's Resolution No. 1,905, dated 18th August 1884. The statements which make

Return No. 41B.

up this return were due from Deputy-Commissioners on 1st June. The following table shows the dates on which they were actually received :—

District.	Date of receipt. In part.	Complete.
Cachar	...	8th June 1885.
Goálpára	...	26th „
Sibságar	...	13th July „
Khási Hills	3rd June 1885	21st „ „
Sylhet	...	24th „ „
Nowgong	31st May „	1st August 1885.
Darrang	15th June „ / 20th „ „	10th „ „
Nága Hills	19th May „	15th „ „
Gáro „	27th July „	17th „ „
Kámrúp	9th „ „	23rd „ „
Lakhimpur	...	25th „ „

83. The checking of these statements proved a work of more than ordinary labour, as it was found that in many cases they contained most serious errors. The discrepancies between Form B (Agriculture) of this return and the crop statement which accompanied the sections of the District Administration Reports (paragraph 9) will be indicated later on. But there were numerous other mistakes. The following are some of the more grave of these:—

Checking

Errors in the return.

Form A1.—Cultivated and Uncultivated Area.

1. The total area of the district in acres differed often from the area shown in Statement C multiplied by 640.
2. Area in column 6 was not always the difference between areas of columns 2 and 5, as it should have been.
3. The actually cropped area (column 7) almost always differed from the total cultivated area shown in column 7 of the District Crop Statement.
4. The area of forests was sometimes included, sometimes excluded from the uncultivated area of column 12. It ought always to have been excluded.

Form C.—Surveyed and Assessed Area.

1. The total area (column 2) did not always agree with the same as shown in Form A1., column 2.
2. The land revenue, as stated in column 5 of this statement, was not always the same as that shown in Form E., Fiscal (6, Land Revenue).
3. The areas shown in this statement as ryotwari, zamindari, and waste land grants, should agree, with the areas of the same in FormI.E.3.Fiscal (varieties of tenure held direct from Government), but they did not always do so.
4. The totals of the columns were repeatedly wrong.
5. The calculations involving incidence of the land revenue were also constantly wrong.

Form B.—Agriculture.—Crops Cultivated.

1. The figures for the Assam Valley districts ought to have agreed with those given in the District Crop Statements. They did not always do so.
2. The area under tea should have been the same for each district as that given in the reports on which the Tea Report is based, but there was often a considerable difference.

B.—The District Crop Statement.

84. The mauzadars' papers furnish the figures for a consolidated statement showing the area under various crops in the Assam Valley. The following table gives, in acres, the figures originally forwarded by Deputy-Commissioners :—

Original crop statement.

Statement A.—(Acres.)

Name of district.	Area settled with, or held revenue-free by			Area under cultivation.		Total cultivation.	Percentage of column 7 to column 4.	Early rice.	Late rice.	Mustard.	Cane.	Pulse.	Other crops.	Betti.	Fallow.	Total.	Deduct twice-cropped.	Total cultivated area.
	Tea-planters.	Other than tea-planters.	Total.	Tea.	Ordinary crops.													
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Goálpára ..	487	67,145	67,632	487	61,106	61,593	91·07	17,220	38,516	9,259	25	554	450	5,095	3	71,114	10,008	61,106
Kámrúp ..	24,900	585,939	610,839	6,343	548,449	554,792	90·83	140,121	246,718	71,381	4,042	14,080	11,3	39,516	1,437	528,676	81,113	447,563
Darrang ..	100,616	247,065	347,681	16,708	208,950	225,658	64·93	20,443	138,343	10,615	2,204	8,530	17,064	16,859	7,940	227,899	22,421	204,968
Nowgong ..	Not gn.	Not gn	Not gn.	10,851	265,192	276,043	Not gn.	72,914	123,556	46,889	5,593	16,534	39,355	Included in col. 14		304,744	39,552	265,192
Sibságar ..				Not forwarded.									58	Not forwarded.				
Lakhimpur.	175,752	97,386	273,038	27,112	90,856	117,970	43·20	7,578	66,526	1,670	1,106	557	11,216	Included in col. 14		89,363	1,493	87,869
Total ..	....	....	....	.....	.....	....	....	....	....	....	..	....	...	.....	....	....	....	..

85. The entries were checked and compared with the figures in Form B (Agriculture) of Return No. 41B., and with those in the Tea Report. The following is a consolidated statement in acres prepared from the original district figures in Form B of Return No. 41B. :—

Original Form B.

Statement B.—(Acres.)

District.	Cereal and pulses.			Oil-seeds.	Sugarcane.	Fibres			Indigo.	Coffee.	Tea.	Tobacco.	Other crops.	Miscellaneous.		Total area of crops.	Deduct area cropped more than once.	Actual area on which crops were grown.
	Rice.	Wheat.	Other food-grains, including pulses			Cotton.	Jute.	Other fibres.						Food crops.	Non-food crops.			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Goálpára	55,639	..	1,003	9,233	25	..	..	..	..	..	486	..	..	5,080	6,042	77,518	9,991	67,527
Kámrúp.....	386,846	..	14,090	71,381	4,042	..	..	..	..	..	6,343	..	..	..	52,317	535,019	81,179	453,840
Darrang.....	164,987	..	8,529	10,618	2,204	388	248	..	..	..	13,004	257	..	16,162	16,866	233,054	22,421	210,633
Nowgong	192,684	..	16,014	46,059	5,436	3,286	..	..	..	100	10,851	..	..	14,185	15,720	304,335	38,610	265,725
Sibságar	313,210	..	7,766	10,505	4,938	74	..	..	..	..	40,346	..	64,229	..	..	440,968	7,449	333,519
Lakhimpur	72,636	..	532	1,604	1,094	..	..	..	..	..	27,112	..	..	13,219		116,128	89	116,128

Obviously, column 17 of B, minus column 12, ought to agree with column 17 of A, minus column 16. But this is not the case in any district, though in Darrang the difference is but slight. Similarly, column 18 of B ought to, but does not, except in Darrang, agree with column 18 of A.

Figures from Tea Report.

86. The Tea Report gives the following areas in acres :—

Name of district.	Area actually under tea.	Area settled with tea-planters.
Goálpára	495	1,473
Kámrúp	6,343	24,900
Darrang	16,679	96,926
Nowgong	10,851	65,857
Sibságar	43,884	1,90,052
Lakhimpur	28,405	1,28,098

Clearly, column 12 of B, and column 5 of A, ought to agree with each other and with column 2 of the statement immediately above. Kámrúp and Nowgong come out well from the above test, but in all the other districts we find different figures furnished for each of the three statements. Column 2 of A should agree with column 3 of last table. It does so in the case of Kámrúp, but not in that of any other district for which comparison can be made. Similarly, the areas under the different crops obviously ought to be same in both statements. But a very cursory examination will show that there are inexplicabe discrepancies.

Revised crop statement.

87. After some correspondence with Deputy-Commissioners, revised statements were obtained. Their figures have been consolidated into the table below :—

Statement C. (acres.)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	Area settled with or held revenue-free by			Area under cultivation.														
Name of district.	Tea-planters.	Other than tea-planters.	Total.	Tea.	Ordinary crops.	Total cultivation.	Percentage of column 7 to column 4.	Early rice.	Late rice.	Mustard.	Cane.	Pulse.	Other crops.	Basti	Fallow.	Total.	Deduct twice cropped.	Total cultivated area.
Goálpára ..	487	67,145	67,632	487	61,106	61,593	91·07	17,220	38,616	9,250	25	555	449	5,096	3	71,114	10,008	61,106
Kámrúp .	25,362	638,495	661,307	6,343	565,286	571,629	86·44	140,131	246,715	71,381	4,042	14,090	11,364	39,516	1,437	528,676	81,179	447,497
Durrang ..	100,616	247,065	347,681	16,708	223,274	239,982	69·02	29,443	135,343	10,615	2,204	8,530	17,055	16,859	7,340	227,389	22,421	204,968
Nowgong ..	71,620	244,527	316,153	10,851	265,192	276,043	87·31	57,788	119,387	43,482	5,436	16,014	16,433	13,109	4,306	275,949	38,103	237,846
Sibságar ..	224,333	356,658	580,991	40,912	301,127	341,339	58·87	12,918	200,392	10,505	4,938	7,786	42,251	22,052	26,273	326,996	7,449	319,547
Lakhimpur.	178,752	97,286	276,038	47,112	90,858	117,970	43·20	7,415	65,221	1,604	1,094	552	6,748	7,986	5,973	96,593	1,604	94,989

The majority of these figures are now correct, but the following are still wrong :—

In Goálpára columns 2, 4, 5, 6, 7, 8.
„ Kámrúp „ 2, 4, 6, 7, 8, 17.
„ Darrang „ 2, 4, 5, 6, 7, 8, 9, 10, 12, 15, 17, 18, 19.
„ Nowgong „ 2, 4, 6, 7, 8, 14, 17, 19.
„ Sibságar „ 2, 3, 4, 5, 6, 7, 8.
„ Lakhimpur „ 2, 4, 5, 7, 8.

Finally-corrected crop statement and Form B.

88. I will state first what the correct figures are, and then indicate the manner in which they should have been obtained. The following statements are believed to be nearer approximations to the truth than those which have gone before:—

Statement A'. (acres.)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	Area settled with or held revenue-free by			Area under cultivation.														
Name of district	Tea-planters.	Other than tea-planters.	Total.	Tea.	Ordinary crops.	Total cultivation.	Percentage of column 7 to column 4.	Early rice.	Laterice.	Mustard.	Cane.	Pulse.	Other crops.	Basti.	Fallow.	Total.	Deduct twice cropped.	Total cultivated area.
Goálpára	1,473	67 145	68,618	495	61,103	61,598	89·47	17,220	38,616	9,250	25	555	449	5,096	3	71 114	10,008	61,106
Kámrúp..	24,900	635,045	659,945	6,343	563,849	570,192	80·96	140,131	246,715	71,381	4,042	14,090	11,364	39,516	1,437	528,676	81 179	447,497
Darrang..	96,926	247,065	343,991	16,679	223,204	239,882	69·73	29,224	135,563	10,615	2,203	8,530	17,055	11,015	7,340	221,546	12,182	209,363
Nowgong.	65,857	244,527	310,384	10,851	226,810	237,661	76·58	57,788	119,387	43,482	5,436	16,014	13,491	13,103	4,306	273,007	38,103	234,904
Sibságar..	190,052	356,662	546,714	43,884	301,788	345,672	63·22	12,918	200,392	10,505	4,938	7,786	42,251	22,052	26,273	326,996	7,449	319,547
Lakhimpur.	128,098	97,286	225,384	28,405	90,858	119,263	52 91	7,415	65,221	1,604	1,094	552	6,748	7,986	5,973	96,593	1,604	94,989
Total ..	507,306	1,648,630	2,155,036	106,657	1 477 612	15,84,268	444·78	264,696	805,894	146,827	17,738	47,607	91,358	98,769	45,332	1,517,921	150,526	1,367,401

Statement B'. (acres.)

District.	Cereals and pulses			Oil-seeds.	Sugarcane.	Fibres			Indigo.	Coffee.	Tea.	Tobacco.	Other crops.	Miscellaneous		Total area of crops	Deduct area cropped more than once.	Actual area on which crops were grown.
	Rice.	Wheat.	Other food-grains, includ-			Cotton.	Jute.	Other sorts.						Food crops.	Non-food crops.			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Goálpára	55,736	..	555	9,250	25	..	..	..	..	..	495	..	..	..	5,545	71,606	10,008	61,598
Kámrúp	386,846	..	14,090	71,381	4,042	..	..	..	..	..	6,543	..	..	..	50,880	533,582	81,179	452,403
Darrang	164,787	..	6,439	10,615	2,203	400	348	..	..	..	16,679	257	..	..	27,165	230,894	13,189	218,705
Nowgong	177,175	..	16,014	43,482	5,436	105	..	..	..	100	10,851	..	..	..	26,489	279 952	38,103	241,849
Sibságar	218,210	..	7,766	10,605	4,938	74	..	..	..	..	43,884	..	..	..	64,230	344 607	7,449	337,158
Lakhimpur	72,636	..	852	1,604	1,094	..	..	..	..	..	28,405	..	..	..	....	....	1,604	....
Total	1,070,390	..	47,507	146,937	17,738	579	348	..	..	100	106,857	257	..	..	174,309	1,460,381	150,525	1,311,410

89. It will be observed that these agree exactly with each other in all respects in which agreement is required. Column 17 of A' includes fallow as shown in the mauzadars' papers, but excludes tea. Column 17 of B' excludes fallow, but includes tea. Column 16 of B', gives the total of "*Basti*" and "Other crops" (columns 14 and 15 of A'). If from column 19 of A' fallow be excluded, we should have the exact area under crops as shown by mauzadars without the tea which is entered in their papers. Column 19 of B' shows the exact cultivated area as it appears in the mauzadar's papers, *plus* the area under tea on the tea estates. I will now take up the districts *seriatim*.

90. *Goálpára.*—Columns 2 and 5 of Statement C were corrected from the Tea Report, and therefore column 4 required correction. Column 6 was wrong, because it included fallow. Corrections in columns 5 and 6 involved corrections in columns 7 and 8. It was found impossible to check the remaining figures of the statement, because no details of mauzadars' figures were furnished. Statement B' for this district was prepared from Statement A', as many of the calculations from *bighas* into acres proved erroneous, and no data were given to show how the Deputy-Commissioner had obtained his figures in Statement B, for columns 4, 15, and 16.

91. *Kámrúp.*—Column 2, Statement C, was wrong, because it differed from the Tea Report. This rendered column 4 incorrect. Column 17 was slightly out, owing probably to a copyist's error. The crop details (columns 9 to 19) were checked with the following statement, and were found (with the exception of column 17) perfectly accurate:—

Statement of crops as returned by mauzadars. Kámrúp, 1884-85.

	Area in acres.
Tea	2,669
Ahu	58,952
Bao	43,857
Ahu and báo	6,921
Sáli	181,241
Ahu and sáli	14,696
Mustard	16,401
Ahu and mustard	54,980
Pulse	9,508
Ahu and pulse	4,582
Sugarcane	4,042
Cotton	....
Other crops	11,364
Homestead	39,516
Fallow (waste)	1,090
Jungle	347
Total	450,166

The following is the method by which they were checked:—

	Acres.
Ahu + *áhu-báo* + *áhu-sáli* + *áhu*-mustard + *áhu*-pulse—(58,952 + 6,921 + 14,696 + 54,980 + 4,582)=	140,131
Sáli + *báo* + *áhu-báo* + *áhu-sáli* (181,241 + 43,857 + 6,921 + 14,696)=	246,715
Mustard + *áhu*-mustard (16,401 + 54,980)=	71,381
Pulse + *áhu*-pulse (9,508 + 4,582)=	14,090
Sugarcane	4,042
Other crops	11,364
Basti	39,516
Fallow and jungle	1,437
	528,676
Deduct twice-cropped area = *áhu-báo* + *áhu-sáli* + *áhu*-mustard + *áhu*-pulse (6,921 + 14,696 + 54,980 + 4,582)=	81,179
	447,497

If to this be added 2,669, the area under tea, we obtain 450,166 acres, being that shown by mauzadars. Having obtained 447,497 as above, we can now get column 6 thus—

	Acres.	
447,497—1,437 (fallow)=		446,060
Add—		
45-year grants	39	
Special tenures	140	
Chamuas	1,146	
Nisf-khirdj	97,723	
Lá-khirdj	18,741	
		117,789
Total		563,849

If to this we add the area under tea, 6,343, we obtain column 7, and thence column 8.

92. *Darrang.*—Columns 2 and 5, Statement C, are wrong, as they differ from the Tea Report. Hence column 4 is wrong, too. Columns 9, 10, 12, 15, 17, 18, 19 are wrong, owing probably to mistakes in calculation.

The statement below gives the figures returned by mauzadars:—

Statement of crops as returned by mauzadars. Darrang, 1884-85.

	Area in acres.
Tea	8,610
Ahu	17,042
Báo	3,695
Sáli	125,752
Ahu and sáli	6,116
Mustard	5,835
Ahu and mustard	4,780
Pulse	7,244
Ahu and pulse	1,286
Sugarcane	2,203
Cotton	400
Other crops	16,655
Homestead	11,015
Fallow (waste)	2,720
Jungle	4,620
Total	217,973

As in the case of Kámrúp, the correct areas should have been thus obtained :—

	Acres.
Áhu + *áhu-sáli* + *áhu*-mustard + *áhu*-pulse, (17,042 + 6,116 + 4,780 + 1,286) =	29,224
Sáli-báo + *áhu-sáli*, (3,695 + 125,752 + 6,116) =	135,563
Mustard + *áhu*-mustard, (5,835 + 4,780) =	10,615
Pulse + *ahu*-pulse, (7,244 + 1,286) =	8,530
Sugarcane	2,203
Other crops	17,055
Homestead	11,015
Fallow and jungle	7,340
Total	221,545
Deduct twice-cropped area—	
Ahu-sáli + *áhu*-mustard + *áhu*-pulse, (6,116 + 4,780 + 1,286) =	12,182
	209,363

If to this be added 8,610, the area under tea, we have 217,973, as obtained from the mauzadars' papers. We are now in a position to obtain column 6. The cultivated area from mauzadars' papers, after deducting fallow, twice-cropped area, and tea, is 202,023. The estimated cultivation on *nisf-khiráj*, *lá-khiráj*, and special tenures, as given by Deputy-Commissioner, is 21,840. Deducting 659 acres, the fallow on *nisf-khiráj* and special tenures proportional to the fallow on the mauzadari area, we have 21,181 acres as the cultivation to be added to 202,023. This gives 223,204 as the approximate area under crops other than tea.

93. *Nowgong.*—Column 2, Statement C, is wrong, because it differs from the Tea Report. This vitiates the total in column 4. In column 14 the Deputy-Commissioner includes 2,942 acres under tea shown by mauzadars. This, of course, should have been excluded. Columns 17 and 19 are wrong, because column 14 is. Column 6 should have been filled up in the following way:—

		Acres.
Total area shown by mauzadars, *minus* tea		273,007
Deduct—		
Twice-cropped	38,103	
Fallow	4,306	
		42,409
Balance		230,598
Add—		
Estimated cultivation for *nisf* and *lá-khiráj*	6,112	
Coffee	100	
		6,212
		236,810

This figure affects columns 7 and 8. The Deputy-Commissioner's original figures (Statement A) included not only estimates for the area under different crops, on *nisf-khiráj* and *lá-khiráj* lands, but also on those held under a hoe-tax.

94. *Sibságar.*—Columns 2 and 5, Statement C, are wrong, as in other districts, owing to disagreement with the Tea Report. In the figures of column 3 there is a slight error in calculation. This affects the accuracy of column 4, and therefore of column 8.

The correct figures for column 6 were thus obtained:—

	Acres.
Cultivated area as given by mauzadars after deducting twice-cropped lands, fallow and tea.	293,274
Add estimated cultivation for *lá-khiráj*, special tenures, &c.	8,514
	301,788

The error in column 6 affected column 7.

95. *Lakhimpur.*—Columns 2 and 5, Statement C, disagree with the Tea Report, and thereby affect columns 4, 7, and 8 also. All the other columns are right. The Deputy-Commissioner's original figures (Statement A) were vitiated by the inclusion of estimates for crops on *lá-khiráj* and *nisf-khiráj* lands. Column 6 has been correctly estimated by the

Deputy-Commissioner, but as his method of obtaining the result differs somewhat from that prescribed, it may be as well to indicate how it should have been done:—

		Acres.
Total cultivated area as shown by mauzadars, *minus* tea		96,593
Deduct—		
Fallow	5,973	
Twice-cropped	1,604	
		7,577
Balance		89,016
Add—		
Estimated cultivation of *lá-khiráj* and rent-free lands		1,842
		90,858

VIII.—Trade and Trade Statistics.

Trade reports.

96. Separate reports are published annually dealing with the foreign trade of the Province and with that carried by the Brahmaputra and Surma, the two great rivers of Assam. It is superfluous, therefore, to enter into details here, but a few remarks may be appropriately made in connection with the subject of a tea trade with Thibet.

Brick tea.

97. When I was at Dewangiri in February, I saw bricks of tea as usual with the Bhutias. I made enquiries on the subject, and ascertained some particulars. The Bhutias stated that the tea was brought by traders from a place called Janar Jeppoo, situated a year's journey to the north-east. To indicate the direction they pointed at first due north and then due east, intimating that a traveller to Janar Jeppoo from Bhutan would have first to go north and then east. They stated that they had given in exchange for a brick two cloths of *eri* silk, each cloth containing as much thread as they had bought for the equivalent of Re. 1-4 in the Assam Valley. Estimating roughly the labour of weaving at 12 annas per cloth, the cost of the tea would appear to have been Rs. 4 per block. That this could not be its real price in Bhutan was proved by the fact that I bought it at Rs. 3-8 in Dewangiri. The price last year was, as far as I can ascertain, Rs. 2-4 in the same place. The Bhutias stated that it had become dearer in the interior. I enquired why they drank tea which had come such a distance when a much cheaper kind was to be obtained in Assam. They stated that Assam tea was bitter, but that the tea they had with them was sweet.

Making of Bhutia tea.

98. I watched in one instance the process of making the infusion. Two pots, one of brass and filled with water, the other an earthen one and empty, were put over a fire. A piece was broken off a brick of tea and crumpled up in the hand to separate the adhering leaves and twigs. The handful so obtained was put into the dry earthen pot, and stirred up for a few seconds till hot. Then about a couple of wine-glasses full of potash water (made by straining water through ashes) was poured on the dry tea, and when the heat had almost evaporated the moisture, another spoonful of water (now hot) was added from the brass pot. The tea meanwhile was kept stirred to prevent its burning, and, when nearly dry, a second, and then after an interval, a third spoonful of water was added. When this, too, was almost dry, all the water from the brass pot was poured in, and, a teaspoonful of salt having been added, the mixture was boiled. As soon as the bubbles showed that the liquid was boiling, it was ladled out with a spoon formed from a gourd into a sort of churn made from a thick piece of bamboo about two feet long. The churn was provided with a wooden cover, through a hole in which a piston-rod worked, the piston being simply a round piece of wood roughly fitting the interior of the churn. The boiling liquid having been poured in, the churn was worked for a few seconds, and then about a tablespoonful of *ghi* was added to the mixture. The churn upon this was worked vigorously for a few minutes, considerable pressure being evidently required to force the piston up and down. The Bhutia next poured back the liquid into the earthen pot, which meanwhile had remained on the fire, and tasted the tea. He stated that more salt was wanted, and added accordingly about an eggspoonful. The whole was boiled again for about a minute, and then tasted and pronounced right. The amount was about equal to the contents of two ordinary quart bottles.

Tea trade with Thibet

99. Attempts have been made to produce from the refuse of tea-gardens a substance resembling Bhutia brick tea, but so far they appear to have been unsuccessful. It would seem, however, that the endeavour should not be given up, as there can be little doubt that if planters could manufacture a commodity which would suit the taste of the Bhutias, Assam tea might penetrate eventually into Central Asia. Bhutia tea can hardly be the produce of any country but China, and although recent enquiries tend to show that Chinese tea can be carried wonderfully cheaply into Thibet, yet it is hardly possible that Assam tea could not undersell it. Even supposing that the Bhutias more than doubled the real price in their statement to me, and that in Bhutan Chinese tea can be bought at Re. 1-8 per brick (about 5¼ annas per pound), I imagine an Assam planter, if he could produce a similar article at all, could do so for three annas a pound, or even less. This would certainly enable him to sell with a profit, and yet at a price which would probably induce the Bhutias to buy.

The obvious objection to any attempt to manufacture brick tea is that, even if made, trade with the savage tribes on the Assam borders is too inconsiderable to produce any effect on the tea industry of Assam. The objection is perfectly sound as far as these tribes are themselves concerned, but it will not apply if we can once break the Chinese monopoly. If the Bhutias perceive that they can buy the materials for the extraordinary mixture they call tea at a cheaper rate in Assam than in Bhutan itself, they are likely to make their purchases here instead of in the interior. Once introduced at a cheap rate into Bhutan, it is more than probable that our tea would pass into Thibet, and its spread in the interior of Central Asia would be then regulated mainly by the cost of its carriage from Assam, as compared with the cost of carriage of Chinese tea from China.

Jági trade post

100. At the point where the Kopili and Kollong meet in the district of Nowgong, there is a lonely police-station occupied by a few constables. The Kopili forms, with the aid of its tributary streams, the main outlet for a considerable portion of the trade of the Mikir, North Cachar, and Jaintia Hills. The Kollong forms the waterway for a large portion of the produce of the Chapari mauzas of Nowgong. The capabilities of the spot as a point at which trade could be registered were at once perceived by Mr. Driberg on his transfer to Nowgong, and, upon his representation, a traffic registration post was started there in September 1884, with the establishment noted in the margin. Up to the close of the financial year the total value of the trade registered amounted to Rs. 11,75,641. I inspected the post in April 1885, and found the work progressing satisfactorily. The information obtained at Jági will throw much light on the details of the trade of Nowgong and the hills that border it to the south.

	Rs.	
1 Clerk on	35	per month
1 Peon on	6	"
2 Boatmen, @ Rs 6 each ..	12	"

IX. Miscellaneous.

Percentage maps

101. At the end of the appendices are given four maps, illustrating in colours for the Brahmaputra Valley the following points :—

Map 1.—The percentage of tea to the total cultivated area of each district.
Map 2.—The percentage of rice to the total cultivated area of each district.
Map 3.—The percentage of mustard to the total cultivated area of each district.
Map 4.—The percentage of cultivation to the total area of each district.

No figures are obtainable for the hill districts or the Surma Valley, as no statistical agency exists in that portion of the Province. This is the reason why no cotton map was attempted, for this commodity is almost entirely grown on all but the highest portions of the main central range.

I have the honour to be,

Sir,

Your most obedient Servant,

H. Z. DARRAH,
Officiating Director of Agriculture, Assam.

The 2nd September 1885.

APPENDIX A.

Supplementary Rules for keeping up Dag Chithas and Jamabandis.

1. The mandal will in future keep up a periodic and annual *dág chitha* to correspond with his periodic and annual *jamabandi*.

2. The periodic *dág chitha* will show first the fields which were given on ten-year leases, then the fields which were given on nine-year leases, and so on.

3. Although the ten-year, nine-year, eight-year, &c., *dágs* will be numbered in one series, each group will be prepared separately, and bound up only when all are complete.

4. At the end of each group a separate abstract showing the lands resigned will be given each year.

5. In column 1 of the periodic *dág chitha*, the mandal will enter the serial number of the *dág* for the year in which the periodic *patta* was issued. Provided that if the *patta* was issued in the current year, the mandal will enter in column 1 the serial number of the previous year.

6. In column 2 he will enter the serial number of the current year.

7. The serial number of the annual *dág chitha* will not continue the series of the periodic *dág chitha*, but will begin afresh from No. 1.

8. In column 1 of the annual *dág chitha* will be entered the serial number (from column 2) of the previous year.

9. The periodic *jamabandis* will in future show two numbers for each *dág*.

10. These two numbers will always agree with the numbers shown for each *dág* in the above periodic *dág chitha*.

11. In the annual *jamabandis* there will be but one number to each *dá*, and this will agree with that entered in column 2 of the annual *dág chitha*.

12. After the current year, two copies of the periodic *dág chitha* and two copies of the periodic *jamabandi* will not be necessary.

13. The changes that can occur in the periodic *dág chithas* and periodic *jamabandis* will be of two kinds:—

(*a*) Fields resigned.
(*b*) New lands given on periodic leases.

14. In case (*a*) the mandal will correct his own and the kanungo's copy of the periodic *dág chitha* and *jamabandi* by drawing his pen through the number resigned, and recording the date of the resignation. This correction will be made in red ink.

15. He will then prepare for each group in the periodic *dág chitha*, the abstract referred to in paragraph 4.

16. In case (*b*) the mandal will prepare two separate *dág chithas* and two seperate *jamabandis* of the new lands given on periodic leases. The former will be stitched one to his own and one to the kanungo's copy of the periodic *dág chitha*. The latter will be stitched, one to his own and one to the kanungo's copy of the periodic *jamabandi*.

17. He will then prepare at the end of the periodic *dág chitha* and *jamabandi* an abstract showing the total changes made.

18. The papers of each mandal must be kept entirely distinct from those of another mandal That is, under no circumstances can one series of numbers run through more than one mandal's circle.

19. If a pattadar has land in more than one mandal's circle, he must receive a separate *patta*. from each mandal for the land occupied within his circle.

20. The mandal should write out at the end of his *dág chitha* a list of the page totals, and make a grand total then. He should not carry on the totals from page to page.

21. The names of the pattadars in the periodic and annual *jamabandis* should be alphabetically arranged.

APPENDIX B.

Rules of October 1884 for the Management of Survey Schools.

The following rules for Survey Schools are prescribed in supersession of those published on the 15th February 1883:—

PART I.—Management of Survey Schools.

1. Survey schools will be maintained for the present by Government as follows:—

In Kámrúp	...	...	...	...	...	...	2 schools.
„ Darrang	...	...	...	...	...	...	1 school.
„ Nowgong	...	...	...	...	...	...	1 „
„ Sibságar	...	...	...	...	...	...	1 „

2 The schools will be under the direct charge of the Deputy-Inspector of Schools in each district in subordination to the Director of Agriculture, and all expenses connected with them will be defrayed, after 1st April 1885, out of the Agricultural budget.

3. The following scale of expenditure is sanctioned:—

Kámrúp ...	Each school	...	One master on	Rs. 50 a month.
			„ „ „	„ 40 „
			„ peon „	„ 7 „
			Contingencies	„ 36 a year.
Darrang ...			One master on	„ 40 a month.
Nowgong ..		„ ...	„ peon „	„ 7 „
Sibságar ...			Contingencies	„ 36 a year.

The present schools at Jorhát and Mangaldai may also be continued on a similar scale of expenditure to that in Sibságar and Tezpur, provided the mandals of those sub-divisions agree to bear the whole cost. Provided also that if these schools prove inefficient, the Director of Agriculture shall be at liberty to abolish them.

4. The maximum number of pupils at the schools with two masters shall be 48 and at schools with one master 30.

5. Ordinarily, the maximum proportion of candidates to mandals shall not exceed 1 to 5, and in no case shall candidates be admitted if by so doing any mandals are excluded.

6. Admissions to the survey schools shall be made only at the beginning of each term. There shall be four terms during the year:—

First term	...	...	...	...	...	1st January to 31st March.
Second term	...	...	...	...	...	1st April to 30th June.
Third term	...	...	...	...	...	1st July to 30th September.
Fourth term	...	...	...	...	...	1st October to 31st December.

There shall be no holidays or vacations, except those gazetted as public holidays for the district.

7. At the end of each term an examination, called the term examination, shall be held by two officers, one of whom shall be the Deputy-Inspector of Schools and the other one of the following, at the option of the Deputy-Commissioner:—

(1) Extra-Assistant-Commissioner.
(2) Sub-Deputy-Collector.
(3) Subordinate Executive Officer of the Public Works Department.

8. The course of instruction and the standard of examination for the term examinations are as follows:—

Course of Instruction for Term Examination.

(1) *Arithmetic*, including (*a*) the first four simple rules, (*b*) the four compound rules, (*c*) reduction so far as it applies to Indian money and to Assamese land measurement, *i.e.*, the reduction of square feet to *bighas*, *kathas*, *lesas*, and *vice versa*.
(2) *Mensuration*, including (*a*) the use and construction of scales, (*b*) the use of compasses for plotting, (*c*) finding the area of a triangle, given its base and vertical height.
(3) *Surveying*, including (*a*) surveying with the 30-foot chain and cross staff, by the system of chain triangulation with offsets to bends, (*b*) recording the results in a field-book, plotting them out on a scale of 16″ to the mile, and calculating the area in *bighas*, *kathas*, and *lesas*.

Subjects of Term Examination.

(1) One paper in arithmetic and mensuration (equal number of questions in each subject)—100 marks.
(2) The actual measurement with the 30-foot chain of a plot of ground not less than 10 *bighas* in area, making a map of the same on the scale of 16″ to the mile, and calculating the area in *bighas*, *katas*, *lesas*—100 marks.

9. The results of the term examinations will be reported jointly by the examiners through the Deputy-Commissioner to the Director of Agriculture, to whom the papers of those who obtain marks exceeding 50 per cent., together with a correct map of the ground surveyed by them, shall be sent. On receipt of the names of the successful examinees from the Director of Agriculture, the Deputy-Commissioner will issue second-class certificates, and will make the necessary entries in the registers of mandals and mauzadars.

10. Examinees who obtain less than 50 marks in either the paper or the practical survey shall be considered to have failed.

11. The course of instruction and the standard of examination for the annual examination are as follows:—

Course of Instruction for the Annual Examination.

The course for the second grade, and in addition the following subjects :—

1.—Arithmetic, including—

(*a*) Rule-of-three.
(*b*) Greatest Common Measure.
(*c*) Least Common Multiple.
(*d*) Vulgar fractions, so far as is necessary as a preparation for decimals.
(*e*) Decimals (omitting repeating decimals).
(*f*) Tables of English land measurement.
(*g*) Reduction from *bighas*, *kathas*, and *lesas* to acres and decimals, and *vice versa*.

2.—Mensuration, including—

(*a*) Use of the tale square and area comb.

3.—Surveying, including—

(*a*) Use of the optical square.
(*b*) Surveying with the Gunter's chain.
(*c*) Recording the results in a field-book and plotting on any given scale and calculating area in acres and decimals of an acre.

Subjects of Annual Examination.

(1) One paper in arithmetic and mensuration—100 marks.
(2) The actual measurement with a Gunter's chain of a plot of ground not less than five acres in extent, making a map of the same on the scale of 16" to the mile, and calculating the area in acres and decimals of an acre, and also in *bighas*, *kathas*, and *lesas*—100 marks.

12. The annual examination will be held on the 1st February of each year at the head quarters of each district by the Deputy-Inspector and an Extra-Assistant-Commissioner deputed by the Deputy-Commissioner for the purpose. The papers will be set by the Director of Agriculture assisted by the Deputy-Superintendent of the Cadastral Survey, and the answers will be sent in to the former by the Deputy-Commissioner. The field-book and map made by each mandal, together with a correct map of the ground surveyed, will also be sent to him, with a certificate from the Deputy-Inspector and the Extra-Assistant-Commissioner that the land was measured and plotted in their presence, that so many hours were occupied in the work, and that the mandal received no help in it. The Director of Agriculture will report the result of the examination to the Commissioner of the Assam Valley Districts, who will issue first-class certificates to those who have passed.

13. Examinees who obtain less than 50 marks in either the paper or the practical survey shall be considered to have failed.

14. Ordinarily, the school hours will be from 7 to 10 A.M. and from 1 to 5 P.M., but the Deputy-Inspector of Schools may fix other hours with the sanction of the Deputy-Commissioner, provided the total be not reduced.

15. The following registers will be kept up:—

(1) Detailed register of daily attendance.
(2) Abstract register of daily attendance.
(3) Admission register giving details as to parentage and residence, &c., of all mandals and candidates admitted.
(4) Expenditure register, showing monthly cost of survey school.
(5) Receipt register, showing all sums realised, such as fees from candidates, &c.

16. The following instruments will be kept for the use of the pupils:—

At each school in Kámrúp—

Optical squares	5
Gunter's chains	2
Area combs	10
Tale squares	10
Thirty-foot chains	6
Mathematical instruments in boxes	3
Drawing compasses	20
Parallel-rulers	10
Brass or electrum plotting scales	10
Cross staves	8

At each of the remaining schools—

Optical squares	3
Gunter's chain	1
Area combs	5
Tale squares	5
Thirty-foot chains	6
Mathematical instruments in boxes	2
Drawing compasses	15
Parallel-rulers	5
Brass or electrum scales	5
Cross staves	6

The teachers will be held responsible that these instruments are kept clean and in good order

17. Every teacher or set of teachers at a survey school ought to pass one-fourth of the total number of mandals attending his school through the term examination at the end of every quarter.

Fractions less than one-half to be omitted; thus, if there are 17 or 18 mandals, the teacher should pass 4. If there are 19, he should pass 5.

18. For every mandal passed in excess of this minimum, a reward of Rs. 10 will be given to the teacher, and for every mandal below this minimum who fails to pass, a fine of Rs. 5 will be inflicted.

19. Mandals who fail to attend regularly after their names have been entered on the list, shall lose their pay for each day of absence, except in case of sickness supported by medical certificate, and accepted by the Deputy-Inspector.

20. Rules 18 and 19 *mutatis mutandis* will apply to candidates, except that the rewards and fines will be only Rs. 4 and Rs. 2 per candidate.

21. If a fine is inflicted, owing to failure of the requisite percentage of mandals to pass, no reward can be given, no matter how many candidates are passed, but fine on account of failure of candidates will be no bar to reward for the passing of mandals.

22. On receipt of instructions from the Director of Agriculture showing what rewards or fines are to be inflicted, the Deputy-Commissioner will incorporate them in the next pay-bills of the teachers.

PART II.—Liability of Mandals and Mauzadars to pass the Survey Examinations.

23. In the four districts in which survey schools are provided, all persons now holding the office of mandal shall be required by the Deputy-Commissioner to attend the school and to pass the examination prescribed in Rule 7.

The Deputy-Commissioner may, however, exempt any mandal from attendance and examination on the ground that his service has hitherto been approved, and that he is too old to profit by instruction.

24. Only one mandal at a time shall ordinarily be sent from any one mauza to the survey school, and during his absence his work shall be distributed by the mauzadar amongst the remaining mandals of the mauza. Provided that if the mauzadar, in the opinion of the Deputy-Commissioner needs a substitute, one may be appointed on Rs. 3 a month and maintained at Government expense during such period, not exceeding two terms, as the mandal he is acting for may require to enable him to pass the term examination.

25. A mandal who fails to pass the examination at the close of his second term of study will be liable to summary dismissal. Provided that the Deputy-Commissioner may, under special circumstances, permit the mandal to remain at the school for a third term, or may exempt him from passing the examination.

26. A mandal who has obtained a second-class certificate will be allowed to study for the first class during two terms under the conditions noted in Rule 25. If he passes the annual examination he will receive a first class certificate.

27. A mandal who passes the term examination and obtains a second-class certificate will be eligible for promotion to the Rs. 8 grade, provided the Deputy-Commissioner on general grounds thinks him suitable for such a grade. A mandal who passes the annual examination and obtains a first-class certificate will at once be promoted to Rs. 8, if not already in that grade, and will be capable of promotion to Rs. 10 a month.

28. The Deputy-Commissioner shall keep a register of all the mandals in his district in the appended form. Column 6*a* or 6*b* will be filled up from the examiner's report. When a mandal fails to pass, and is dismissed under Rule 26, the fact will be noted in column 7. All orders of dismissal of mandals under Rule 26 shall be made by the Deputy-Commissioner, and shall be final.

29. All persons now holding the office of mauzadar in the four districts in which survey schools, are established will be required to pass the term examination within one year from 1st April 1885; and failing this, they will be liable to dismissal. Provided that the Commissioner may exempt any mauzadar, on cause shown to his satisfaction, from the operation of this rule. All orders of dismissal of mauzadars under this rule shall be made by the Deputy-Commissioner, subject to confirmation by the Commissioner.

30. A mauzadar may present himself at any term examination, or at the annual examination, without having attended the survey school, on condition merely of giving the examiners one week's notice. Any mauzadar who desires to attend the survey school thay do so, the number of mandals or candidates being reduced in order to admit him, but he shall not ordinarily be allowed to attend more than two terms without passing.

31. No mandal or mauzadar can appear at the annual examination until he has obtained a second-class certificate.

32. The Deputy-Commissioner may make whatever arrangement he considers best for carrying on the work of a mauzadar studying at the survey school.

33. After the 1st April 1886, no person shall be appointed to the office of mauzadar who has not obtained a first-class certificate under these Rules. Provided that the Deputy-Commissioner may nominate a second-class certificated or unpassed candidate for approval by the Commissioner, if no other suitable person is available.

PART III.—Admission to the Survey Schools of Candidates for the Post of Mandal.

34. After the 1st April 1885 no person shall be appointed to the office of mandal who has not obtained a second-class certificate under these Rules. Provided that the Deputy-Commissioner may appoint an uncertificated candidate if no other suitable person is available. But a special report must be made explaining the circumstances, and the Commissioner's sanction must be obtained to such an appointment.

35. Candidates wishing to attend the survey school shall apply for permission to the Deputy-Commissioner, who will regulate the number to be admitted according to the vacancies in the school. No candidate should be admitted who is not already well acquainted with the first four rules of arithmetic and cannot pass an examination in them.

36. If a candidate fails to obtain a second-class certificate at the end of his second term, he must be removed, unless the Deputy-Commissioner, for special reasons, permits him to remain.

37. A candidate may present himself at the term or at the annual examination without attending the survey school; but, if so, a fee of Rs. 2 for the term examination and of Rs. 4 for the annual examination will be levied.

38. A candidate who has obtained a second-class certificate may continue his studies in the higher grade for two terms, but not longer, unless he obtains the special permission of the Deputy-Commissioner to remain during a third term.

39. Candidates shall pay a fee of Rs. 2 for every month or part of a month of their attendance in the survey school. This fee must always be paid in advance.

40. Candidates not attending the school who wish to present themselves at the annual examination must give one month's previous notice to the Deputy-Inspector.

41. A candidate shall not be less than 18 or more than 30 years of age when he presents himself for examination.

42. Candidates attending the school shall be charged no fee for the annual or term examinations.

43. The Deputy-Commissioner shall keep a register of certificated candidates in the form appended to these Rules.

The name of any candidate who shall not have received an appointment within three years from the date of his obtaining a certificate, shall be struck out of the register unless the Deputy-Commissioner decides for special reasons to retain it.

Forms.

Form of Second-class Certificate given at the Term Examination.

Certified that son of resident in village mauza district obtained the marks noted below at the term examination of the Survey School, held on the day of 188 , *viz.*, *Arithmetic and Mensuration* marks, *and Surveying* marks, and has been awarded a second-class certificate.

Dated the day of 188

(Sd.)

Deputy-Commissioner.

Form of First-Class Certificate.

Certified that son of resident in village mauza district obtained the marks noted below at the annual examination under the Survey School Rules held at on the day of 188 , *viz.*, *Arithmetic and Mensuration* marks, *and Surveying* marks, and has been awarded a first-class certificate.

Dated the day of 188

(Sd.)

Commissioner.

Register of Certificated Candidates.

1	2	3	4			5			6	7	8	9		10
Name of candidate	Father's name.	Age when he passed the examination.	Birth place.			Residence.			Date of passing the examination	Place of passing.	Class of certificate obtained	Marks obtained in		Deputy-Commissioner's initials and remarks (if any) and date of appointment when any is given).
			District.	Mauza.	Village.	District.	Mauza.	Village.				*Arithmetic and Mensuration.*	*Survey.*	

Register of Mandals.

1	2	3	4	5	6		7	8
Mauza.	Name of mandal.	Date of appointment.	Approximate age on 1st January 1885.	Date of entering survey school.	Date and class of certificate.		Date of order of dismissal on account of failure to pass.	Explanation of reasons for exemption from attending survey school.
					a. 2nd.	b. 1st.		

APPENDIX C.

Additional Rules for the management of Survey Schools in the Assam Valley Districts.

1. The following additional rules for the management of survey schools in the Assam Valley have been framed for the guidance of district officers. These Rules do not supersede, except as hereinafter provided, those published on the 21st October 1884.

I. The Annual Examination.

2. Survey, with plane-table and sight rule, will form part of the course of instruction for a first-grade certificate, and will be one of the subjects of the annual examination in addition to those already fixed.

3. The examination will take place during the cold weather on dates which will be notified from time to time by the Director of Agriculture. There will be one examination in each district where there is a survey school, and the Director of Agriculture will personally preside.

II. The Term Examination.

4. The term examination will occupy two days. It will be conducted in the manner indicated below:—

(a) First day.

5. The first day will be occupied by the paper in Arithmetic and Mensuration. It should be set by the Deputy-Inspector of Schools, and submitted for approval to the Deputy-Commissioner.

6. The officer presiding at the examination, (who should be nominated by the Deputy-Commissioner out of those mentioned in Section 7, Rules of 21st October 1884,) will read out, or cause to be read out, a translation of the Arithmetic and Mensuration paper. The questions will be taken down by the examinees, and they will be allowed three hours from the time such reading out is finished.

7. Each examinee will be supplied with one small book, containing two pages of foolscap size, for each question given. He will not be allowed to take any paper whatever with him into the examination-room.

8. Each examinee should write one question on the top of the left-hand side of each leaf. He will thus have two pages (or one leaf) for working out the answer, and will always have the question before him while working.

9. All work must be shown in the answer-book, but no more than one book can be allowed to each examinee.

10. An examinee, who has once entered the examination-room, cannot be allowed to leave till he has given up his book of answers, and once he has left, he cannot, under any circumstances, be allowed to return.

(b) Second day.

11. The second day's examination will be restricted to survey by cross-staff and chain and to plotting at the time of the survey of the selected area. It is essential that the survey and the plotting should both be completed together on the ground. No field-book will, therefore, be required.

12. No land in the immediate neighbourhood of the school should be chosen for the survey, and care should be taken to ascertain that the piece selected for the examination has not been already surveyed by any of the examinees.

13. Pieces of ground on which rice has been grown should be selected, as the plotting of a number of flags or trees on an open plain is totally useless. Flags should be so planted along the

exterior boundary as to render that boundary irregular. Where *sáli* fields have been chosen, the small ridges made to hold up the water should indicate the boundary between any two flags.

14. It would prolong the examination too much if the examinees were required to plot all interior *kiaries* (or *dubhás*). It will be sufficient if two or three irregularly-shaped fields be marked out within the selected area. This should be done by erecting small earthen mounds at the requisite corners.

15. There should be one piece of ground not less than 8 *bighas* in extent for each group 10 or 12 examinees.

16. There should be twice as many flags fixed as there are men to be examined, and each flag should bear a serial number, which could be written on a piece of paper and pasted on the flag-staff.

17. Each examinee should have two flag-staves indicated to him, the line joining which should run, as far as possible, across the centre of the ground. He should be directed to regard this as his base-line, and the centre fields must invariably be plotted from it, but he will be at liberty to cut up the selected area into blocks as he pleases. He must show every flag-staff, with its number, on the plan when plotted.

18. As each examinee will thus have to plot from a different base-line, most of the measurements will differ from each other, and collusion will be difficult, and in some cases impossible

19. Each examinee should be provided with one plane-table (with a sheet of paper pasted on it), one chain, one cross-staff, or optical square, one pair of compasses, one ruler, and one chainman. He will be allowed to bring with him and to use a diagonal scale and an offset slip.

20. The examination should invariably begin at 8 a.m., and the examinee should have taken their food before coming to the ground. The selection of the ground, the planting of the flags, and the marking out of the interior fields in each plot should have been completed by the time the examinees arrive. An hour will probably be spent in placing the men, and the survey will probably take four or five hours. The men should be allowed whatever time they require for making the map, as accuracy is of more value than speed. At the same time, a fast worker should get credit for his quickness, and the hour at which each map is finished should be noted upon it.

21. When the plotting is over, each examinee will sign his name upon the map, which will be at once removed from the plane-table, and retained by the officer presiding.

III. General Directions.

22. The Survey-master should be excluded from the examination during the time occupied by the examination; but on the second day after the plotting is over, he should be employed to make a rigidly accurate map of the ground surveyed.

23. The Arithmetic and Mensuration papers should be invariably examined immediately after they are given up, and those who have failed to pass should be excluded from the remainder of the examination. This will materially reduce the area to be selected, and the number of flags and chainmen required.

24. As far as possible, peons should be utilised as chainmen. As a rule, not more than fifteen or twenty men will require to be examined in practical survey on the second day. It ought to be possible to provide this number of men from office chaprasis, Nazir's process-serving peons, and the Deputy-Inspector's peons. Each school has, besides, one chaprasi, who should be utilised.

25. The following words will be struck out of the Rules published on 21st October 1884:—

From Rule 8, "recording the results in a field-book."
From „ 11, " ditto ditto and"
From „ 12, everything but the last sentence.

26. The following instruments, in addition to those mentioned in Section 16 of the Rules of 21st October 1884, will be kept at each school:—

Plane-tables	20
Sight rules	20
Pins for maps	50
Gunter's chains	20
Optical squares	10